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AMAZING STORIES

Science Fiction

Vol. 8 OCTOBER, 1933 No. 6

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Our Cover

depicts a scene from the story entitled "Men Without Shadows," by Stanton A. Coblentz, drawn by Morey.

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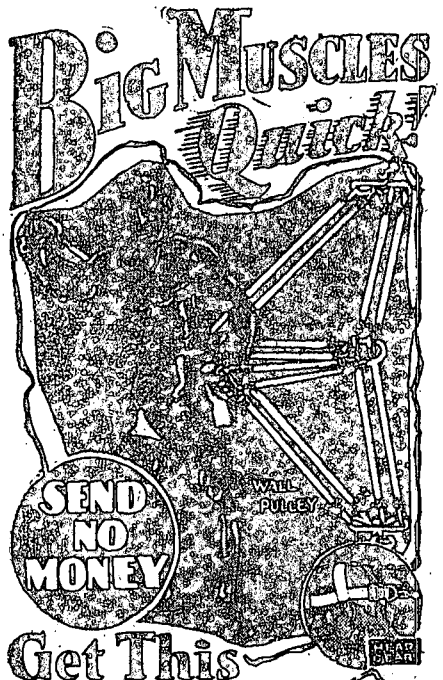

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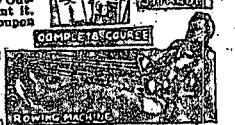

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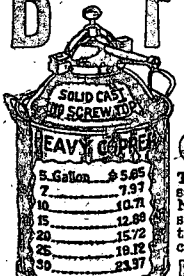

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Extravagant Fiction Today . . . . . Cold Fact Tomorrow

The Early History of the Electric Light

By T. O'Conor Sloane, Ph.D.

ABOUT 133 years ago Sir Humphrey Davy produced an electric arc between two pieces of charcoal and this may be taken as practically the birth of the electric light. Very little effect of illumination had been given so far by any heated conductor, but the electric arc was a true light. The mind of the experimenter seems to have been fixed on the idea that the arc, the little flame-like body, extending from pole to pole, was the light-giving element. Later on, carrying out this idea of the importance of the arc, Sir Humphrey Davy, using an immense battery, one of two thousand jars, produced an arc four inches long. This gives an interesting illustration, or example, of an early misconception of the electric arc lamp. The carbons are now operated quite close together, and what the arc does is not to give light in itself to any extent, but to supply a path of conduction of high resistance and of very small dimensions. This makes it a concentrated spot of heat, and as the current passes, the two carbons become intensely hot and the light is derived from them, the arc giving a very small proportion. The early investigators quite misunderstood the operation of the arc as an illuminating agent, but experimented vigorously and tried to reduce the high resistance of the charcoal electrodes by treating them with metallic mercury. They seemed to have no objection to the idea of disseminating

mercury vapor through the air that they were breathing.

The great trouble in experimenting with any apparatus requiring a strong and continuous electric current was in the battery. The primary battery of those days was a very poor affair and to-day, it is fair to say that except for special uses, the modern primary electric battery is poor enough. We can imagine the labor of setting up Davy's two thousand cups of primary battery, filling each cup with the acid, making the four thousand connections to the plates and realizing that from the moment the battery was started by bringing the acid and plates together, it began to run down. Even if left on open circuit while theoretically idle the battery would lose strength rapidly, would polarize as it is called, and would exhaust the acid and dissolve the zinc. From the instant it was set up it would begin to destroy itself.

THE electric arc excited great attention in those days, people thought it was of a much higher illuminating power than it really was and this idea lasted for many years. They were warned not to look at it directly for fear of some injury.

Difficulties in the use of the primary battery were so great in the development of power that the electric arc remained a thing of spectacular and theoretical interest only. Up to within quite a recent period, the so-called calcium light was the principal source of illumination for the magic lanterns, the progenitor of the moving pictures of to-day, which are projected by the use of the modern electric light.

The great Faraday, Sir Humphrey Davy's assistant, and who, it is said, was treated sometimes with scant civility by the older scientist, had produced electric currents mechanically. These were very slight and trivial, but his laboratory apparatus was the progenitor of the gigantic dynamos of the present day. And when a self-contained mechanical generator of electricity, and that is what a dynamo is, came into being, the electric arc light became a possibility and the most diverse efforts were made to bring it into use. At first the construction of a feed mechanism for maintaining the carbons at the proper distance from each other, offered considerable difficulties, and various inventors worked upon the subject. The machinery for feeding the carbons was more or less complicated and accordingly efforts were made to produce an arc lamp which would burn for a reasonable period without any machinery. The great problem then was stated to be the development of a method of dividing the electric light—the arc light giving several hundred candle power was not what mankind wanted, what was wanted was to divide up this illumination into smaller units and the expression—"The Division of the Electric Light" became a sort of by-word among investigators in the last century.

It is astonishing how much has been forgotten of the early work in this direction. A division of the electric light, to a certain extent, and the dispensing with feeding mechanism for the carbon was brought out by the Jablokoff candle, which played a very big part in the discussions and work of the last century. This consisted of two carbon rods thinner than a lead pencil, and perhaps eight or ten inches long, enbedded in a plaster-like composition which held them parallel to each other and at a distance apart of a fraction of an inch, for by this time inventors realized that a long arc was not desirable. The Jablokoff candle was mounted in the position of the everyday candle, in a socket, the terminals of the

circuit being connected to the lower ends of the two carbon rods. A little bit of carbon was laid across between the upper ends of the main carbons and when the current was turned on this rapidly became incandescent, burned out in a few seconds, and the arc started. The idea was that the arc would persist until the candle burned down to the socket just as an ordinary wax candle would do.

This instrumentality for illumination was tried on an extensive scale both indoors and outdoors and much to the terror of the gas manufacturers the division of the electric light seemed at last to be effected.

In the direct current arc light one carbon always burns much more rapidly than the other, so the Jablokoff candle had to be operated by an alternating current. Its life was rather short and when it died a natural death, it was pretty well forgotten and to-day, just as the wireless operator, in many cases, never knew what a coherer is, the modern electric lamp technician in most cases, could not tell you what a Jablokoff candle was.

THE power of the electric arc, when its mechanism was completed so that it could be used for a number of hours' work without any attention, was greatly exaggerated. It was always spoken of as of 2000 candlepower but it probably was of less than half that power.

The division of the electric light on the basis of the arc was found to be almost impossible. The experiment was tried of putting it on a very high pole, perhaps 100 feet in height, and depending upon it to illuminate a large area. It was so small that the shadows which it cast were very sharply defined. There was no penumbra, that is, no shading off of the edges of he shadows. We were told that people stooping down would try to pick up the shadow of a twig, cast by the arc light on the pole, as if it was a real one.

Edison, by this time had won his fame as the wizard of Menlo Park and he attacked the problem of the subdivision of the light. If a lamp could be devised which would operate by pure incandescence of a solid, without any arc and with a consecutive conductor, it would seem that the problem would be solved. Every one looked to him for the solution and his platinum wire lamp was described and illustrated in the press as important news.

In this lamp a little vertical coil of platinum wire in the general shape of an inch of lead pencil was ignited by the current and gave light. Through its center a metal bar passed and when the coil approached the danger point of fusion, the expanion of this bar, acting on a switch, opened the circuit and reduced or cut off the current. In practice, this was supposed to act almost like a variable resistance, the makes and breaks as far as they were produced, succeeding each other with a rapidity approaching continuity. It was not satisfactory, so going down the line the substance was sought which, unlike platinum, was virtually infusible. Chemistry had not advanced very far in those days, at least there was much ahead of it to be discovered, and for the electric lamp it appeared that the most obvious substance which would conduct electricity, which was practically infusible, so that it could be brought up to a white heat, was carbon, the very substance of the pencils or rods of the arc light. Edison tried a filament of carbon using any number of materials to get a good substance, sealed it in the bulb just as in the tungsten lamp of to-day, and pumped out all the air. To do this he used a mercurial pump of the Sprengel type and at one time he had 500 of them in his laboratory at Menlo Park.

The filament in the shape of the in-

verted letter "U" was contained in a bulb more or less pear-shaped, and from this form only slight departures have been made during the many intervening years. At "one fell swoop" a lamp was devised without any mechanism, one that would require no attention during its lifetime, and which would burn hour after hour without change. The thing that struck people who saw these lamps for the first time was that they were looking at gas flames and not at an electric light, so perfect was the invention.

FOR many years there has been a standard of light for gas on which contracts were often based. A burner, consuming five cubic feet an hour of standard gas, was supposed to give 16 candles of illumination, though it often gave much more. This was the light given by sixteen standard sperm candles. It became the goal of the everyday incandescent electric lamp.

All sorts of carbonaceous materials were used as the basis for the filament. Edison had the world combed over to get the best material. The filament was subjected to various treatments. It was ignited to a red heat in an atmosphere of hydrocarbon vapor. This gradually diminished its resistance so that by regulating the time of this preliminary ignition it could be brought to any desired number of ohms. The filament which may have started almost as charcoal by this and other subsequent treatments became hard and elastic, which greatly increased its strength under disturbance by shaking or otherwise. When cold the filament was extremely elastic. A long filament, started into vibration by shaking the bulb, would oscillate back and forth with such extreme rapidity as to produce a sort of spectral image. It was a very interesting illustration of the elasticity of a solid body.

The great feature of the incandescent lamp was that it gave even illumination when subjected to a standard potential. Thus two leads of wire could be carried any distance and could be maintained at a definite potential difference, one from the other, and incandescent lamps connected across them like the rungs of a ladder, would be steadily lighted by the current. As the difference of potential would be greater near the source of electricity than at a greater distance, lamps of different voltages could be used on different portions of the leads. Inside the lamp bulbs as high a vacuum as possible was produced, then they were hermetically sealed so that the vacuum within them was permanent. For many years the carbon filament in the incandescent lamp was used with great success for house illumination.

One of the early incandescent lamps deserves a special notice, it came so near to being the perfect solution of the problem. It depended on the ignition of a clay filament to a white heat. The filament was virtually infusible, was absolutely unaffected by the oxygen of the air, it seemed to do away with the difficulties inherent in the old-time incandescent lamp with its carbon filament. This is the Nernst lamp, pretty well forgotten now, but from some points of view the best of the incandescent lamps. But like many other seemingly good things, it did not reach a successful exploitation.

When Edison worked on the incandescent lamp, he had also to provide a system of conductors for it. It was simple enough to run two conductors in parallel with each other, wherever light was desired. In this way, the conductors would have to be thick enough, that is to say, of low enough resistance, to economically carry the current for a single lamp or for a whole group, per-

haps a hundred or more. The lamps were made of about 110 ohms resistance, some were of higher resistance than the others, determined by the points of the conductors where they were to be used. The happy idea then occurred of using a central conductor to maintain a difference of the standard amount of about 110 volts, between the central conductor and the right-hand conductor on one side and another 110 volts between the central conductor and the left-hand lead. The lamps were then connected from center to one side or the other of the group of conductors. In a general way they were supposed to be connected symmetrically, so that the arrangement was like a "ladder," which not only had its two sides, but had a central bar to support the rungs. This of course is a mere comparison. The three-wire systems brought about a most interesting condition that double the voltage could be used on the circuit and for the same number of lamps on a two lead circuit 33 1/3% more copper would have to be used.

If one lamp was turned off the other one would receive the potential existing between its outside conductor and the central one. If both were turned on, each would receive its proper voltage giving an aggregate of double the amount for one lamp. Now comes the personality element as it may be called. If all the lamps on such a circuit were going at once, they would be supplied by the two outside leads only and the central lead might be cut off for any good it would do, but the moment one lamp was shut off, the equilibrium would be disturbed and the central lead would have to pass current for the odd lamp. Now if all the lamps on one side were turned off, then everything would be done by the central lead and one of the outside leads, leaving the third one idle. But in the course of human events, it was almost impossible that all the lamps on one side should be turned out. It was quite safe to assume an average dimension for the central lead based on how the customers would handle their lamps in the way of turning them off or turning them on. It, therefore, appeared to be quite safe to reduce the size of the central lead. As a popular way of putting it, it may be said that this relation of sizes of leads was based on how human nature would treat the lamps.

A five wire system was tried and worked well, but never reached any development.

We are all familiar with cellophane, the peculiarly indestructible organic compound used as a wrapper. The question used to be asked, "What becomes of all the pins?" When we find cellophane being wrapped around everything from cigars to candy, the question may be asked, "What becomes of all the cellophane?" If the carbon filament lamp was not extinct, cellophane would seem to be quite an ideal substance as the basis for the filament.

The standard carbon filament lamp, following the lead of the old standard gas burner, gave a light of about 16 candles and required for this the expenditure of nearly 4 watts to each candle power.

Naturally, there was a great desire to use a metallic filament. One of the metals, tantalum, presented possibilities, but the conclusion was reached, oddly enough, that there was not enough metallic tantalum to be obtained in the world to supply the lamps for a year.

The Men Without Shadows

By STANTON A. COBLENTZ

This narration is one of Mr. Coblentz's best efforts. He is a great favorite with our readers, and he absolutely deserves their appreciation; this tale, which we may almost term a 'mystery story,' will be greatly enjoyed by them. It is a science phantasy in the strict interpretation of the words, bringing into the scene visitors from a distant planet, who are opposed to the warlike motives and methods of our earth.

Illustrated by MOREY

CHAPTER I

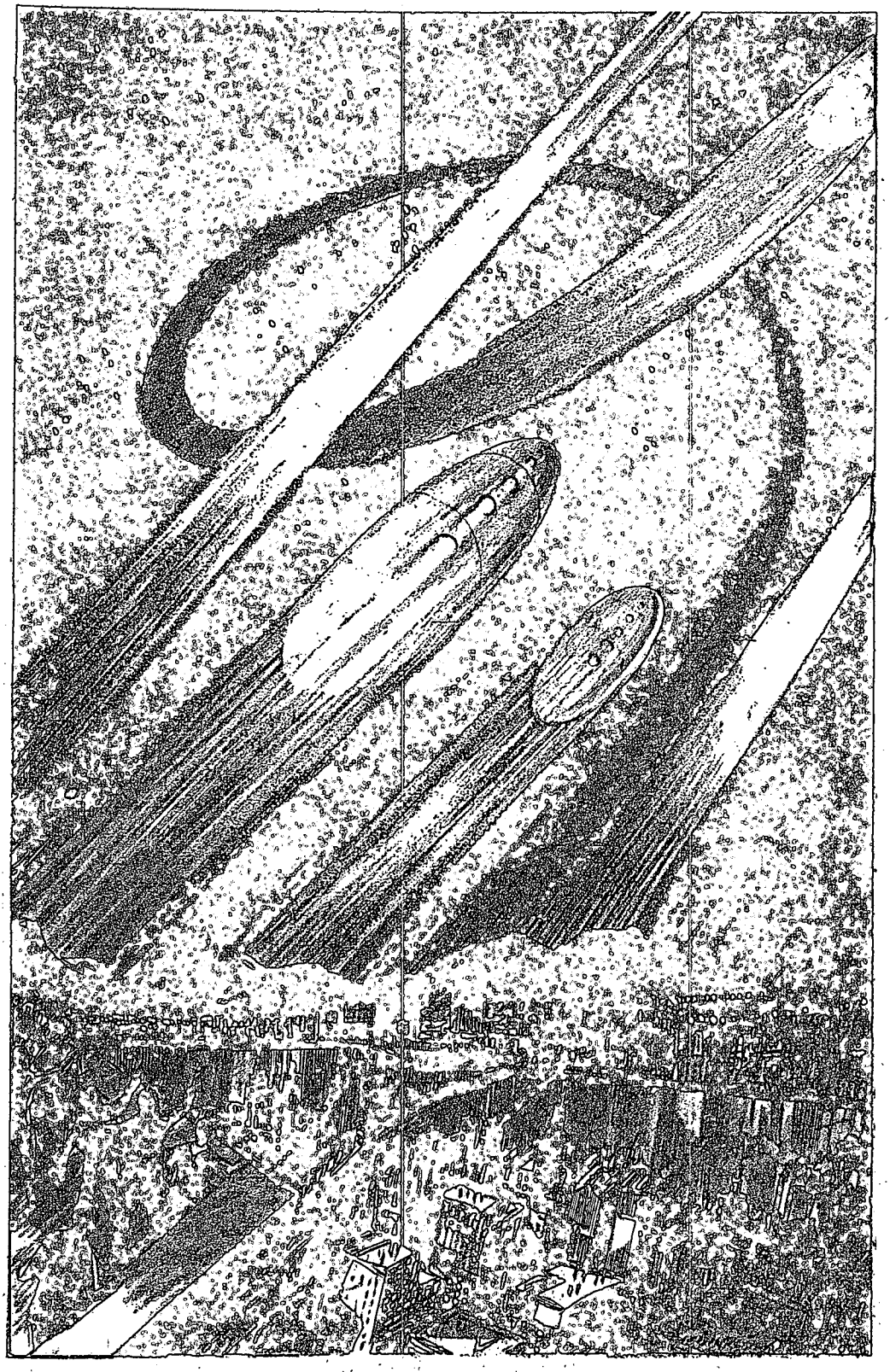
AS long as men continue to read history on this self-regarding, little planet of ours, the year 1999 will be remembered as a time of prodigies and terror.

It was in January of that year that the Intercontinental War, which involved every people on earth except the Esquimaux and the "black-fellows" of Australia, broke forth at the cost of a million lives a day. And it was in February of the same year that the first of the so-called Green Apparitions flamed in the northern skies, startling the world from its absorption in warfare to the contemplation of an appalling mystery.

At intervals of several days, in widely scattered parts of the northern hemisphere, a bewildering celestial spectacle was observed. Invariably it occurred in the hours between sunset and dawn, and invariably originated in the same section of the heavens, which was vaguely described as in the region of the constellation of Hercules. Its general features were those of a gigantic meteor, which, with hissing streamers of green fire, would appear with terrorizing suddenness, and then, instead of falling with ever-increasing velocity, would inexplicably lose in speed and settle to earth in a series of long, gradual spirals.

Since the phenomenon was reported on numerous occasions and from thousands of observers, there was no possibility of ascribing it to the mere hallucinations of the battle-crazed.

As if to throw a further pall of mystery over the whole affair, various strange electrical disturbances were noted at about the same time: unaccountable perturbations in the magnetic needle, magnetic storms of a violent and freakish nature, curious noises over the radio, nearer



On several successive nights the world was treated to the sight of fiery green apparitions ascending; of streaming, comet-like bodies that wound their way upward in long, swift spirals and disappeared in the upper ether.

in sound to human speech than to static and yet wholly incomprehensible—and, most astonishing of all, sudden flashes of purple light, flaring up at regular intervals at night, in the wildest and most inaccessible regions, like signals darted from unknown sources.

True, men did not at first connect all these various manifestations as only the phases of a single overwhelming event. Among the superstitious masses, quick to tear aside the gauzy veils of culture, rumors were rife of evil spirits and demons, and even of the return of Lucifer; among the more enlightened, it was generally believed that the enemy in the Intercontinental War had devised some sinister new means of conflict. But the entire world was aroused to apprehension and terror; and, for a time, interest in the Green Apparitions overshadowed even interest in the war itself.

LITTLE did men suspect that the most awe-inspiring occurrences were still in store! Indeed, so extraordinary were the ensuing events that the testimony of observers was at first powerless against the natural incredulity of man. For could one suspect any person of being other than a lunatic when he reported seeing living beings of a type never before known? Was it not easier to suppose a man to be the victim of delirium than a sober truth-teller, when he mentioned man-like creatures taller than giraffes, who moved across the landscape with the agility of stags and the velocity of wind-driven clouds, and who had huge bulbous heads equipped with projecting searchlight eyes? But even had the descriptions been confined to such details, there might have been many of the less analytical who would take them seriously. The world's skepticism, however, was almost complete when it was announced that, except for their brilliant eyes, the creatures were all but invisible in most lights; that they were of the general appearance of thin vapor, and cast barely any perceptible shadow. "Mere ghosts! Mere bugaboos!" laughed the erudite, and did their best to dismiss the increasingly numerous reports of the reappearance of the strangers.

Yet it is notable that, even at an early date, there were one or two intellectuals who aroused the derision of their fellows by insisting on the reality of the so-called phantoms. Among these was the famous Chinese astro-physicist, Lao Sze, whose prophetic words have long been remembered. Let me quote from a now-famous utterance of this sage, delivered before the Euroasian Scientific Congress in March, 1999:

"Is it not conceivable that there exist on other worlds beings of a totally different physical construction from our own? The body of man has a density and composition suited to the gravity and atmospheric pressure on the earth; but are we not to suppose that, under different gravitational and atmospheric conditions, a different type of body would be evolved? Let us consider a huge planet such as Jupiter. What sort of creature may we reasonably regard as capable of existence there? Were it of our own dense construction, it would hardly be able to make a crawling headway against the tremendous force of gravity. But were it composed of liquids or vapors held together within a tough and yet thin case, it might be able to move with moderate celerity. Such a creature might be so tenuous as not to be seen in many lights, and as scarcely to cast a shadow. I venture to say that the appearance of our mysterious visitors may be explained in some such manner."

MOST of our readers will recall what a howl of ridicule resounded across the earth when Dr. Lao made this celebrated statement. Yet how richly time

was to justify him! In the weeks following his address, the searchlight-eyed intruders were reported with increasing frequency. From a farmer in Alberta the tidings would come that they had been observed for an entire day as he sowed his wheat lands; from the wharves of Odessa the news would travel that they had made themselves visible for hours; from the coffee plantations of Brazil, the great airplane factories of Michigan, the tenements of New York and London and the fashionable resorts of the Riviera, they were reported time after time. Occasionally they were even seen in the Parliaments of the nations, and most often of all they were noticed on the battlefield—as though they took an especial delight in bloodshed and slaughter. And always they had the air of being observing, observing with an intense interest, noting details, and studying the ways of man.

I cannot say just when it was—though, certainly, it was long before 1999 was over—even the most skeptical began to take the existence of the intruders for granted. Then it was that various attempts were made to communicate with them—attempts that met with no more response than if the visitors had been phantoms of the imagination. It was therefore concluded that in all probability they had not the sense organs to grasp our signals, or else were too unintelligent to comprehend them. And since they appeared to go their way peacefully enough, and were never known to molest any man, woman or child, the world gradually fell into the habit of disregarding them; and after a few months, amid the fevers and exactions of the Intercontinental War, the newcomers were as little heeded as if they had been clouds or trees.

But 1999 had not yet passed into history when, with shattering suddenness, the world's pleasant illusion was broken . . . and it was discovered that the "Men Without Shadows" were in reality more formidable than bomb-hurling armies.

CHAPTER II

IT was in October of the fateful year that I first made the acquaintance of the mysterious strangers.

As Minister of State of the United Republics of the West (that vast empire best known by the abbreviation Urow, which reaches from the Caucasus westward to the Pacific), I had been too intensely occupied with the Intercontinental War to give much thought to the supposed visitors from another planet. It had been largely at my stimulation, indeed, that Urow had plunged into the war, for I was convinced that there were trade advantages in the Orient, not to speak of vast mineral deposits, which we could not obtain otherwise than by following the orthodox method—warfare. So important did our objective appear, and so intent was I upon attaining it, that it seemed to me the veriest sentimentalism to speak of the incidental loss of a few hundreds of millions of lives; and I had resisted with all the strength of my tremendous authority the efforts of those weaklings and false humanitarians who desired a premature peace.

Accordingly, it was exasperating to have my plans impeded by the meddling of the "Men Without Shadows." It was worse than exasperating—it was heart-rending, for they appeared at the very moment when I was planning my supreme "coup." How well I recall the occasion! With the tacit approval of the Urowian Parliament, I had called a secret conclave to meet at the offices of State of Omaha (which had long been the Capital, because being far inland, it was relatively safe from airplane attack). Not only the President of Urow and his chief cabinet members, but delegates from Peru, Alaska, the Balkans and

all the other outlying provinces of the Empire, were to be present—and I was to lay before them a proposition of unparalleled importance.

I shall spare the reader all account of the preliminaries of the secret arrival of the diplomats, their whispered conferences in the anterooms, their air of barely suppressed excitement—as though all were aware that something ominous brooded in the offing. I shall not even linger over the opening of the meeting, when the twenty-nine of us (the twenty-nine men who constituted the real government of Urow) gathered in my private office, popularly known as the Hall of the Howitzers, because of the decorations of howitzers and long-range guns that covered the walls. After a brief address by the President, I took the chair; and as I regarded my grizzled and bewhiskered compeers, all of them with that cynical and crafty expression, without which no man nowadays receives his diploma in diplomacy, I felt a surge of vast enthusiasm sweep over me, and eagerly presented my plans:

"FRIENDS and Associates: it is no ordinary occasion that has brought us here today. You realize that, for nine months now, the Intercontinental War has been blazing; and while our newspapers daily report 'overwhelming victories,' you know that we have lost more ground that we have gained. But now I have a scheme that, if put into effect, will give us victory to-morrow. And I know what I am talking about when I say that it can be put into effect, and that all that will be required is courage. But when has a true Urowian ever lacked courage?"

I paused briefly for effect, and was greeted by the expected volley of cheers.

"Above you floats the banner of liberty," I proceeded, pointing to where, just over the marble-flanked door, the black and crimson Urowian flag had been hung, bearing the vivid image of a bursting bomb. "But never has that banner been glorified as it will be—if you accept my plan. You see what I have here." Again I paused, and drew from one of my pockets a little yellow vial, no longer than a man's finger. "What you observe is a one-ounce container of a new chemical, Multicholanicide, which has just been perfected after thirty years of study. I need not reveal its composition, or the name of its illustrious inventor; I need only say that the contents of this vial, poured into a lake or river that supplies the drinking water of one hundred thousand persons, would cause the death of not less than ninety-eight thousand within twenty-four hours."

"Death of ninety-eight thousand? Impossible!" came from a dozen throats, as my hearers, manifestly interested, leaned forward with incredulous smiles.

"You know the action of carbon monoxide," I continued, enthusiastically. "It combines with those essential oxygen-carriers, the red blood corpuscles, and through destroying them has the same effect as a hemorrhage in depleting the blood supply. Well, multichloranicide acts in the same way—but, at a modest estimate, is a million times more effective. It works best when diluted with water. That is why I feel safe in saying that a small amount of the substance—a few hundred pounds, at most—judiciously sprinkled into our enemy's water supply, would bring swift and unavoidable death to nineteen combatants and non-combatants out of every twenty, and would make our conquest not only sure and swift but permanent."

Again I paused for effect. Low gasps of amazement issued from the throats of my hearers; their eyes glittered with a predatory eagerness, their lips drew open with the cruel anticipatory relish of victory. And, with a rush of joy, I

knew that I had already converted them to my point of view!

I HAD continued my harangue, and was pointing to one of the patriotic illustrations that lined the wall on my right—that of a giant siege gun, which would devastate fifteen hundred acres with a shell at a distance of ninety miles—when suddenly I became aware of a curious change in the attitude of my audience. All at once they had ceased to heed my words; all at once their eyes were fixed, with an expression of consternation and terror, upon a spot on the wall just to my left.

And I, as I turned to see what had so strangely stirred them, broke suddenly short in my speech, and joined in their bewilderment and dread.

Through an open window high on the wall, two dazzlingly brilliant white lights were radiating. A little closer together than automobile headlights, they seemed mere moving points of electricity. . . . . things eerie, unearthly, unheard of in all human experience.

Not a word did any of us speak until the lights were fairly in the room; then, as we still stared in awe-stricken silence, we could gradually distinguish the outlines of a hazy form—a form gigantic and yet vaguely man-shaped, with spidery thin legs and huge bulbous head. It was one of the "Men Without Shadows."

I do not know how long we continued speechlessly peering at the apparition. Personally, though never a superstitious man, I felt as if I were seeing a ghost; and not all the stories I had heard of the mysterious intruders could serve to dissipate my sense of something weird and supernatural.

Yet my first sensations of horror were as nothing compared to the astonishing sequel. To be confronted with a specter is startling enough; but to be addressed by the specter is unimaginably more terrifying. Try to picture, then, the alarm, the paralyzing amazement of my companions and myself as a hollow voice broke forth suddenly in deep, sepulchral tones:

"EARTH-MEN, listen to me! I have been waiting long to speak to you, and now the time has come! There is much that you must listen to, and much that you must do!"

With a queer accentuation, as of a foreigner who has only partially mastered our language, this speech rumbled to a close. . . . . Then, for a few seconds, there followed absolute silence, silence that was almost deathly in its tense, unbroken quality.

It was with a shock of relief that we heard the booming voice of the Delegate from the Argentine:

"Who are you? Where do you come from? What do you want of us?"

It seemed to me that the two searchlight eyes grew brighter—so much brighter, indeed, that for a moment none of us could bear to look upon them. The whole room blazed with their glory; it was as if fragments of the sun had detached themselves and fallen among us.

"I am Omanru," came the answer, in tomb-like hollow tones, reminding me of a radio poorly tuned and out of order. "I am Omanru, head of the expedition from the planet Dar—the ringed planet which you, in your jargon, know as Saturn. For the space of nearly one earth-year my brothers and I have been here, studying the ways of your people and your queer babbling tongues—which being but rudimentary and having no complicated thoughts to express, were easy enough to master. What has given us more trouble has been to invent speaking-machines to communicate with you; for our natural speech, being in a different wave-length than yours, is inaudible to your ears—though we, in our turn,

have ears capable of gathering everything you say. But now, earth-men, after many moons, we have made the speaking-machines, which we use to-day for the first time. There is much that we would say to you, and we command you to listen!"

The concluding words were followed by a flash of blue lightning, which flickered across the room and vanished, to the accompaniment of thunderous detonations. And my companions and I, forgetting for the moment our dignity as the leaders of the greatest nation on earth, were reduced to the submissiveness of children, and waited expectantly, timidly, meekly for the next utterances of the Unknown.

When finally the words came, they were spoken with a slow sonorous gravity that could not quite conceal their eerie, other-worldly quality:

"EARTH-MEN, know that we, of the great planet of Dar, have long ago attained the perfection of civilization. We exist in a state of spiritual bliss and freedom, unimaginable by you of this petty, bawling planet. Moreover, we have for ages been able to communicate with our civilized brethren of the Solar System and the outer universe, and for ages have projected our rocket-ships across the abysses of space. The inhabitants of Jupiter, of Uranus and of Neptune are for us as next-door neighbors, and we regularly exchange visits and ideas with these distinguished people. Even you, with your limited understanding, will hardly be able to comprehend the exalted nature of such celestial intercourse . . . so let me pass on. The fact, that most concerns you, is that we have not ordinarily thought it worth while to waste time on this mote you call earth. Not that we do not admit that there may be value even in small worlds; but since, for thousands of years, we have never received any response to our radio messages to this particular planetoid, we concluded that it was either uninhabited, or else populated solely by rudimentary life-forms. Of recent centuries, however, interest in the earth has been growing, and it has been argued that, since nothing is beneath the interest of the student of the lower orders of life, even the earth might have something to contribute to the knowledge of civilized beings. For this reason a score of my companions and myself, being interested in science and having a spare century or two on our hands, recently decided to undergo the rigors of voluntary exile to the earth . . . in order to make it the subject of a report to the League for the Study of Backward Planets."

While the voice of the Unknown was thundering out its syllables with a hollow, strangely unnatural accentuation, one could almost see the terror that was leaping and shivering across the audience. The President of Urow had turned ghastly pale; the Minister of War had subsided into his seat with such an ashen countenance that I feared he would faint; the Minister of Aviation had collapsed into a limp heap, and the Minister of the Treasury was muttering audibly in his horror; while twenty-nine pairs of eyes, on a simultaneous impulse, began to turn questioningly toward the nearest door.

It was the Delegate from the Sudan who, with more daring and audacity than the rest of us, acted upon the impulse that had moved us all alike. Our visitor from Saturn had come to an emphatic halt in his speech when the Delegate from the Sudan, who was a slim, wiry man, slid from his seat and glided toward an exit just across the aisle from him.

At the same instant, the rest of us leapt to our feet, and would certainly have followed the example of the Delegate from the Sudan—had it not been for the unexpected sequel.

All at once a streak of blue flame shot

across the room from end to end, coming within less than an inch of the Delegate from the Sudan. And the man, with an exclamation of pain, stopped suddenly short . . . unable to advance another step.

But the eyes of the Saturnian glowed once more with overwhelming brilliance; and from amid the unseen there came a hollow rattling sound, strangely like mocking laughter.

With drooping head, like a whipped dog, the Delegate from the Sudan retreated to his seat.

"ARE there any more of you who would like the same experience?" challenged the uncanny voice of our visitor. And a dozen more blue flames leapt about the room in warning succession, one of them missing me by a matter of inches.

By this time we had grown about as self-assertive as a flock of sheep. The only remaining flicker of resistance came when the Delegate from Bolivia, who had a revolver concealed amid his clothing, made a hasty attempt to withdraw the weapon and to point it toward the gleaming eyes of the Saturnian. But before he had time to lift his finger to the trigger, a blade of blue flame hissed in his direction, the revolver fell from his grasp and he clutched with an agonized expression at a right hand streaked with the long white scar of a new-made burn.

And again the voice of the Saturnian sounded, in tones disquieting like mockery:

"I am sorry, my friend, but it is a rule among my people that dangerous implements should not be entrusted to children. The sooner you learn the folly of disobedience, the better we will all get along together. Understand, then, that we Saturnians are equipped with electrical knowledge beyond your wildest imaginings. By means of power direct from the heat of the atom, I can hold you all within a charged circle, beyond which you can move only at the risk of your lives. And I can keep that circle charged as long as I wish. Do you desire any further demonstration?"

The awe-stricken silence which greeted these words seemed to convince the Saturnian that no further demonstration was necessary; for after a moment he continued, in solemn tones:

"NOW, earth-men, let me make clear my purpose in coming among you to-day. When my friends and I first arrived at this forlorn little world, we intended merely to make a tour of inspection and return home with a few notes. But what we observed was so startling, that we were forced to change our plans. As I have implied, we have been studying all phases of your life and civilization, sometimes in ways you have little suspected; and all that we have seen has bewildered and appalled us. Even on our own planet, there are a few survivals of the lower forms of life; but never had we suspected that any beings with a glimmer of intelligence could fall to the level of your earth-creatures. We had not been here a day before we began to discover how incapable you are of conducting your own affairs. Why, my friends, the very beetles and ants at your feet could give you lessons. At first we could not believe the obvious facts; you have industries that produce more than you can consume, and yet half of your people live under the shadow of starvation; you have science that could uplift the world with priceless revelations, and yet prostitutes itself to the invention of methods of slaughter; you have nations that could unite to move forward a real civilization, and yet spend most of their time hurling or preparing to hurl bombs across each other's borders.

"But why recite the whole story of corruption, greed and stupidity that writes

itself in letters of blood across your planet? Let me only state the inescapable conclusion. The human race is incapable of self-government. It has not the character nor the intelligence to guide its own life. And so, for your own sakes—since we feel it to be the place of a higher civilization to lend a helping hand—we of the planet Dar have decided to establish a Protectorate over the earth."

"Protectorate?" gasped several of my companions and I in one breath, remembering that this was the very term we applied to backward lands taken under the wing of a great nation.

"Yes, Protectorate!" reiterated the hollow voice of the Saturnian. "Just as children must be controlled by their parents for their own good, so you will be under our authority henceforth. Your own laws will be abrogated; our laws will take their place. Your ancient customs will be abolished; ours will reign in their stead. You will do, speak and think as we command—and he who disobeys will have our chastisement to dread. Thus, and thus only, will you be able to advance to a true civilization!"

The Saturnian came to a thunderous halt; and an impressive silence fell among us. Each of us glanced furtively at his neighbor, and each saw in the other's eyes but a reflection of his own dismay. The Minister of War coughed, opened his lips to speak, but uttered nothing intelligible; the Minister of Submarines leaned forward in his seat and looked as if he were about to protest, but fell back as though struck by some invisible hand.

The terrible eyes of the Saturnian blazed to their full intensity before he resumed:

"I ARRIVED here to-day at an opportune moment. An incredible crime was about to be committed, whereby you were to murder hundreds of millions of your brothers. If I am not mistaken, the arch-criminal"—here the searchlight eyes were fixed upon me with such brilliance that I had to look away—"the arch-criminal sits over yonder. It is he who proposed to poison the drinking waters of myriads of his fellow beings."

Despite the horrible glare of the Saturnian's eyes, I managed to find halting words. "All is fair in hate or war," I quoted, repeating an old adage slightly modified.

A gusty, rattling laughter signified the visitor's reply. "You earth-men have not the moral sense of rats!" he retorted, in disgust. "So let me begin with you, my friend. What do your fellows call you?"

"I am known as the Hon. Alexander D. Coldwater, Minister of State of Urow," I returned, with dignity.

"Then, Alexander," returned the Saturnian, in the manner of one addressing a child, "I think we will begin with you. I believe you will find some of your official stationery in the desk to your right. You will secure some of it, and take down a message from dictation."

"Message from dictation?" I demanded, feeling my face grow hot with anger. "I am not a stenographer!"

"Henceforth you are whatever we direct you to be!" stated our visitor severely. "But do not fear. The message I am about to dictate is a beneficent one. It is to your enemies in the Intercontinental War, suing for peace."

All at once, as if in a prophetic vision, I could see the collapse of all my hopes. The Intercontinental War, that contest which was to have given Urow control of the world, was to be terminated at the mere impudent whim of the strangers from Saturn!

"Why do you hesitate, Alexander?" insisted the voice of our Master. "Go to the desk, and get your writing paper!"

Driven by the impulse of a will strong-

er than my own, I started out of my seat; then, of a sudden, fell limply back into it, shuddering and nerve-racked, yet still able to lift a feeble voice of protest:

"I can't do it! I can't! I can't—I can't break faith and end the war!"

Another instant of silence intervened. I felt the eyes of all my companions fixed upon me, in anxiety and dread. Then suddenly the heavy suspense was shattered:

"Come, Alexander! Come! You are wasting valuable time!"

Instantly there followed such a display of electrical pyrotechnics, as I had never witnessed before. Red flashes; green flashes; blue flashes; orange flashes; streaks and streamers and spirals of mingled red and green and blue and orange; rocket-like explosions of crimson and golden scintillating white stars that hovered near my shoulders and vanished—and all these demonstrations accompanied by a hissing, buzzing and detonating that reminded me of a battlefield. For a moment it seemed to me that my last hour had come!

And then, as suddenly as it had started, the exhibition was over!

Just to my left the Minister of Public Welfare, struck by one of the bolts, was lying in a crumpled, apparently lifeless mass. And the Minister of Education and the Delegate from the Transvaal were bending over him, all to no avail!

"Do not fear! We can revive him whenever we desire!" shrilled the Saturnian. "Now, perhaps, Alexander, you are ready for me to dictate my message!"

Without a word, I arose and slouched over to the desk containing the official writing-paper of Urow.

CHAPTER III

IT is safe to say that never, during all the five or six thousand years since man emerged from barbarism, did the world undergo such changes as during the reign of the Dynasty of Saturn.

What a woeful commentary on human helplessness is furnished by the activities of our celestial visitors! Although the intruders numbered but twenty-one, yet the swarming billions that populated our earth were defenseless again them! The redoubtable gods of ancient mythology, with their wings and their thunderbolts and their magical powers, were not so far superior to mankind as were the natives of Saturn; indeed, no time at all had elapsed before millions throughout the earth had begun to revere them as gods, and to offer prayers to them in shrines and temples . . . until the Saturnians themselves put an end to this practice. Roaming the earth with the speed of a whirlwind, invisible unless they chose to be seen, untouchable by any weapon at man's command, they dominated every land by means of their terrifying lightnings; and yet never were they known to harm any human being, except when defiance grew too resolute. . . .

Their first action was to terminate the Intercontinental War. Dissatisfied with the tardiness of the diplomatic negotiations I had initiated at their conclusion, they appeared on the battlefield, and disbanded the armies by means of irresistibly powerful electric waves—which shattered the big guns and bombing airplanes, destroyed trenches, mines and fortifications, and threw such terror into the troops, that they fled in all directions as fast as their panic-stricken legs would carry them. Never in all history had the armies of any nation been defeated more thoroughly than were the armies of all the world beneath the bolts of the twenty-one Saturnians.

Having gained this bloodless victory (bloodless, because the only casualties were a few thousand that died of fright), the "Men Without Shadows" turned their attention to the govern-

ments of the world. As they had dealt with my associates and myself, so they dealt with the political leaders of the entire earth—kings, emperors, mikados, emirs, sultans soon found themselves taking orders like any house servant; soon were driven to mingle with the commonplace crowd of merchants, artisans, clerks, and street-sweepers they had formerly governed. And when any human being was granted even a shadow of individual power, it was almost invariably some person lifted from a carpenter's bench or a barber's chair in recognition of capacities previously undetected by his fellows.

MY own experiences under the new regime were particularly humiliating. From the moment that the Saturnians assumed control, it seemed to me as if their activities were aimed especially against myself. Not only was I stripped of all my political power; I was compelled to abandon my official mansion, to discharge my servants, to discontinue the use of my fleet of limousines and of my private yacht, to distribute my luxuriant wardrobe among the poor, and to remove to one of the dingier sections of town. Worst of all!—the Saturnians made me the victim of a pernicious theory of theirs that "A man should try all types of experience," and assigned me to an occupation I cannot recall even now without a boiling of the blood. I, Alexander Coldwater, Minister of State of Urow, at whose very word whole nations would once have trembled, was reduced to the rôle of a valet! And, as if that were not sufficiently disgraceful, I was forced to act as valet to a former servant of mine! Picture me now in a lackey's livery, compelled to shine the boots of ex-butler Jenkins, who sits enthroned in a commodious apartment, while I must be content with a miserable back-room! Picture my wife, once a leader in smart society, forced to play the part of nursemaid to the Jenkins children! But no! do not picture any of this! The old rage sweeps over me anew, I feel a clenching of the fists, a tightening of the muscles of the neck, and a tear creeps once more into the corner of my eye at the realization of my own impotence in those days.

For impotent I assuredly was—no fly caught in a spider's web was ever more helpless. The Saturnians had re-arranged the planet to suit themselves, in the attempt to bring "justice" and "equality" into human affairs. The privileged were hurled from their pinnacles; the downtrodden were upraised to the peaks. Through the agency of leaders selected from the lower strata of society, the Saturnians supervised a system whereby each person was assigned to the work he seemed best fitted for; while all who worked were certain to share in the common harvest, so that destitution seemed about to become a thing of the past. . . . I will not dwell upon the details of this system, except to say that it did attain a few minor objects, such as to protect the old and the sickly, to care for the orphaned and the widowed, to reduce vice and crime toward the point of invisibility, to end international and industrial disturbances, to limit hours of work to four a day, and to insure a reign of plenty for all.

IT might be thought that, though the once-privileged classes and the former leaders would object, the mass of men would be well content with the new system. Such, however, was far from the case; the Saturnians, forgetful of human emotions in their cold pursuit of reason, had trodden upon too many popular prejudices. For one thing, they had abolished all national lines, so that only the "country of humanity" was recognized—which, of course, excited the indignation of patriots throughout the

earth. Again, they had refused to recognize organized religion, and declared that the only true religion was the "Religion of Humanity"—which stirred up the fury of good people in every land. And, finally, invading that most sacred institution, the home, they had ignored the innate qualifications of every parent to rear his own children: mothers and fathers not measuring up to a certain degree of intelligence, conscientiousness and morality were deprived of the care of their sons and daughters, who were provided for in State institutions. "Even the animals can beget and give birth," was the atrocious maxim by which the Saturnians justified this practice.

Had the intruders confined themselves to mere theory, or converted theory into practice only in a few rare cases, they might not have aroused such general indignation. But parent-examining clinics were established in every city and town; and the statistics, as announced after the first three years, showed that seventy-five per cent of all parents were adjudged unsuitable company for their children! The best families were affected—in fact the best families were affected far more than the worst!—even His Excellency, the former President of Urow, suffered the humiliation of seeing his children taken from him! While among the ranks of the "Four Hundred" of Urow, not a child was any longer to be seen! True, the children appeared to thrive in the institutions, and rarely did any boy or girl desire to return home; but such considerations, of course, did not in any way serve to allay the popular wrath.

FOR ten years the Saturnians remained in power. For ten years they dominated the earth by means of their irresistible lightnings; while the human agents whom they established throughout the world were inflexible in their support. Yet all the while the subterranean thunders of revolt were rumbling. The rallying calls, "Give us back our children!" and "Preserve the sanctity of the home!" were heard at many a meeting in some fetid basement or attic where ex-diplomats and leaders of finance and society furtively conferred. Dangerous, indeed, were such gatherings; for when the Saturnians learned of them, as they almost invariably did by some process that may have been telepathic, they would avenge themselves by sentencing the conspirators to years of some particularly obnoxious work . . . and thus it happened that one would find once-powerful bankers stoking furnaces, and former "princes of industry" cleaning out sewers, and the Governors of States swinging sledge-hammers on rock piles.

I myself, as one of the most irreconcilable enemies of the Saturnians, had taken a prominent part in the agitation for their overthrow, and as a result was passing most of my days with pick and shovel in a deep coal mine. But during my brief periods of freedom (I was allowed three days above ground each month), I heard abundant evidence of the discontent that was seething all about me.

"Ah, for the good old days!" sighed men who had groaned in poverty before the Saturnians came, and now live in well furnished homes amid an abundance of food. . . "Ah, for the good old days!" mourned those who had been pushed from pillar to post, and jostled in the struggle for bread, and nipped and torn by the birds of prey that convened in the marketplace. . . . "Ah, for the good old days!" was the general lament; and forgotten were wars and revolutions, unemployment and famine, long hours of work and inadequate wage returns, strikes and lockouts and "slum" dwellings and all the now-vanished institutions of pre-Saturnian days. Desperately men longed for the return of the olden times,

over which had suddenly grown a halo that was most romantic; and the popular rallying cry, "Give us back our children!", was turning out to be but the pretext for a general mass movement, since it was indulged in ardently by those whose children remained with them, and by those who had never had any children. Translated broadly, "Give us back our children!" meant, "Give us back our freedom!"

Nor did this cry find expression only in words. From time to time, at intervals of months or years, there were actual attemps at revolt. First a group of farm laborers in Siberia; then a band of former industrialists in South Germany; then the heads of the disbanded armies and navies of Japan and China, along with combination of miners and mountaineers scores of thousands of followers; then a in Kentucky, attempted to wrest control of our planet from the terrible invaders. But as well might a party of infants seek to overthrow an adult State! On each occasion two or three Saturnians appeared at the scene of disturbance—but never more than two or three—and by means of a heaven-shaking display of lightning and thunder shot terror into the hearts of the rebels. In most cases, so overwhelming was the power of the Saturnians, and so keen the dread of them entertained by the rank and file of men—the insurrection was suppressed within an hour, and without the loss of a single life.

But since the leaders were invariably apprehended and punished with years of hard labor, the revolts began to grow less frequent as time went by.

Then at last, after ten years, the opportunity unexpectedly arrived for a rebellion which would not only be more widespread than any of the others but offered more reasonable prospects of success.

CHAPTER IV

DURING all the years of our acquaintance with the Saturnians, it had never occurred to us that they might perhaps have human emotions, human desires—even human follies and weaknesses. So aloof, so superior, so altogether unhuman did they appear that we would as soon have looked for an exhibition of feeling from granite hills. What, then, was our surprise one day to learn that they suffered from a failing common to mankind, and were about to yield to temptation!

In a word, they had grown homesick! They were filled with longing for their native world; longing for their friends and kind! And, having withstood their growing nostalgia for several years, they had finally decided to make a brief visit to Saturn. "Earth-men, we leave you for the time only!" they had announced, in tones of hollow thunder that had been heard on every radio throughout the world. "In a year or two at most we will be back! Meanwhile we leave everything on this planet perfectly organized, with those earth-men we have trained for leadership in absolute control! You will listen to their commands, and obey them in every particular! Farewell!

On several successive nights the world was treated to the sight of fiery green apparitions ascending; of streaming comet-like bodies that wound their way upward in long swift spirals and disappeared in the upper ether. And after the twenty-first of these bodies had been counted, a universal howl of acclamation rang forth. At last we were free!

What need to describe the riots and revels of the succeeding days? Who is there that does not recall the madness that swept over the earth; the bacchanalian fêtes; the abandon of dancing and singing and banqueting that held all lands in its grip, in an eruption of unrestraint

after the severe repression of the past ten years? And who, moreover, does not recall the insane fury with which the representatives of the Saturnians were hunted down? the vengeful hate that pursued all men placed in positions of power by our masters from on high? the bombs and bullets and sword-thrusts that, within a few weeks, had put an end to the life of the last of these miserable beings?

WE citizens of that newly liberated world were literally like school children when the teacher leaves the room. And we were heads over heels in our eagerness to perform every possible prank, and, above all, to restore the splendor of pre-Saturnian days. Everything that the Saturnians had done was hastily undone; national lines were restored, lavish wealth re-appeared by the side of pinch-faced poverty; corruption and strife and inequality returned all the stronger for their enforced absence. And —most important of all—the dethroned leaders of the world were elevated once more to their former power. I, too, returning from the obscurity of the coal mine, sat once more in the pride of high office; while all about me ruled such of my old associates as had survived the Saturnian ordeal. It was typical of our attitude that, in our hasty effort to make up for lost time, our first act was to reassemble our abandoned armies, to rebuild our shattered navies, and so to prepare for the early resumption of the Intercontinental War.

But did we not dread the return of our masters? Yes, most profoundly we dreaded it . . . although a wild, baseless hope had sprung up that perhaps they would never come back. Who knew but that they would be lost among the unfathomable abysses of space? Or that they would find Saturn so much to their liking that they would decide not to make the return journey? However, we could not take serious account of any such possibilities. Our chief hope was in some actual method of defense against the intruders. Perhaps, given time, human ingenuity would prove capable of combating them. . . .

And so hundreds of the world's leading scientists and inventors (all, in fact, who were not trying to perfect new weapons for the Intercontinental War) were devoting themselves to discovering some means of combating the "Men Without Shadows." Scores of devices were proposed, from explosives to poisons; but finally it was agreed that, since the source of their power was electrical, they could probably best be resisted by electrical means. The most promising practical suggestion seemed to be that of a Swedish scientist, Nils Jorgensen, who invented an artificial "lightning machine," capable of generating millions of volts, which could be directed at will by radio over an area of thousands of square miles. Thus, it seemed likely, we would be able to answer the Saturnian bolts with equally powerful bolts of our own—and so perhaps abruptly terminate their power.

A year went by, and the "lightning machines" were established at scores of convenient places throughout the earth. But apparently the men of Saturn were in no hurry. A year and a half passed; two years; two years and a half—and still the searchlight-eyed ones remained mysteriously absent. What had happened? Had they, after all, forgotten to return? A wave of bravado began to sweep the earth; it was rumored that the Saturnians would not come back; that they had been intimidated by our increasing power! And men plunged more ardently than ever back into the old routine of their affairs, increasingly forgetful that the Dynasty of Saturn had ever reigned.

IT was shortly after the resumption of the Intercontinental War that the world's growing complacency was abruptly shaken. I recall that my fellow Ministers and I were again in a jubilant mood; that we were again debating plans to poison the enemy's drinking water by means of Multichoranicide, and were preparing to follow debate with action . . . when once more the Green Apparitions were observed in the skies! On successive nights their eerie trails flashed through the heavens, until a total of twenty-one had been counted! The Saturnians were back among us!

It will be remembered what a wave of terror shot through the earth. It will be remembered how many men cringed and whimpered, and how in many quarters the old habit of surrender to the intruders reasserted itself—so that millions had virtually capitulated even before the searchlight eyes of our visitors had glittered among them. Yet there were some doughtier hearts that held out. Throughout the earth, the "lightning machines" were kept in readiness, their radio-directed bolts ready to be launched at any instant. It was confidently maintained by our experts that not even the tremendous power of the Saturnians would be proof against the attack.

We had not long to wait for the initial assault. By means of radio and television, I was able to sit in my private office, and yet follow every detail of the hostilities. The Saturnians, having roamed the earth for several days without attempting any action, had given notice of their intention to appear at a given time at the Capitol grounds at Omaha, where they would have an important message to deliver to man. And it had been secretly agreed that their appearance on this occasion would provide an unexampled opportunity for testing the "lightning machines."

WATCHING through the televisor, I could see the wide acres of the Capitol grounds, looking deserted as a city of the dead. Not a human being was in sight; though high in air, on a level with the topmost trees, two sun-brilliant eyes were burning; to be followed by another pair, and another, and another, until twenty-one pairs were visible; while the ghostly outlines of the slender bodies could be seen only in a vivid light. Many minutes went by . . . the searchlight eyes did not move, though they seemed to grow even more dazzling bright; it was as if they were waiting, waiting expectantly for some all-important event.

Meantime, I also, glancing at my watch, was waiting for an all-important event. At precisely twelve minutes to five, I knew, the bolts of the "lightning machine" would be launched.

Impatiently I saw the minute hand touch a quarter of five; fourteen minutes of five; thirteen minutes. . . . Still the searchlight eyes did not stir; still the Saturnians were apparently unconscious of impending doom. Then suddenly, above the lawny spaces of the Capitol grounds, a great sheet of flame burst through the air—a blade of scintillating, white heat that leaped toward the Saturnians with incredible, with irresistible speed. It passed—and, where I had expected only emptiness, twenty-one pairs of searchlight eyes were burning as before!

Another blade of devastating white started through the air—but suddenly, as if it had struck an invisible wall in the atmosphere, it wavered, stopped, and fluttered out. . . . And over the radio there came strange rattling tones of mocking laughter. Then, almost instantly, a gigantic column of blue fire jutted heavenward just above the searchlight eyes, and divided in such blazing lightnings and such roaring thunders as this earth had probably never experienced

before. The Saturnians were answering blast for blast!

After the thunders had died down, and after a long, appalling silence, the uncanny voice of Saturnian leader was ringing in the radio:

"O earth-men, O earth-men, your follies multiply each minute! Do you think that with your childish little lightning-sparks you can daunt us?—daunt us, whose electical powers could tear your little planet to shreds? No, earth-men, you only amuse us! You only amuse us, and we need amusement, for our hearts are sad.

"WHAT is it, O earth-men, that we have seen here upon return? During ten of your years we have labored to bring you nearer to civilization. We gave of our time and our wisdom, and abolished the greed and strife and injustice that were corrupting your lives. Then, in the vain hope that you were reasonable creatures antd would profit from all we had taught you, we left for a year or two —only to find that neither your intelligence nor your honor could be trusted. Like beasts that slink back to the filth of their lairs; like worms that crawl back to their ancestral mud; you returned to your slime the instant we left you. So now, O earth-men, the question arises in our minds: shall we give ourselves to you once more, and lift you again toward the skies?"

There was a pause, during which the heavens flashed and glittered with the incandescence of darting shafts of white lightning.

Then again the voice of the invader was heard, sonorous and hollow across the radio:

"But my companions and I have just conferred, and have decided that, after all, our ancestors were right in supposing the earth to be an insignificant planet, unworthy of attention. How can it be worth while to save you earthmen, since you will not put forth a finger to save yourselves, but go back to your old brutish ways, the instant our backs are turned? If beings so unenlightened wish to destroy themselves, why in the name of a better universe should we interfere?

"So farewell, earth-men. We leave tonight for a more promising world. Nevertheless, we thank you for some valuable instruction. We bear back with us to Saturn the materials for a paper on: THE PREJUDICE AGAINST CIVILIZATION: A Study in the Instincts of Earth-Men."

There was another gust of harsh rattling laughter; then all grew silent. The searchlight eyes gradually became dim, and faded to invisibility; there was a final flicker of blue lightning above the treetops, and the Dynasty of Saturn had become a thing of history.

With a sigh of relief, I rang for my Secretary. "Bring me the latest figures on the Multichloranicide tests," I directed, when the man appeared. And as he left the room, I swung contentedly back in my swivel chair, smiling in high satisfaction with the world and with myself, for now that the "Men Without Shadows" had withdrawn, there would be nothing further to interfere with the successful prosecution of the Intercontinental War.

THE END

Theft of the Washington Monument

By ROBERT ARTHUR, JR.

This story gives us a strange picture of time travel, and of a mysterious machine of great power. Two of the characters of the story take possession of the Washington Monument in the National Capital and take themselves within it off thousands of years into the future. In one place it is subjected to an attack by rays which they fear will be turned upon themselves if they remain, so they resume the flight into the future and going many more years ahead find themselves upon an absolutely desert earth. They are on the point of seeing destructive collisions between an asteroid, the moon and the earth itself when they go back in time and they and the monument once more find themselves in Washington, and time has receded with them to the present day. The story is highly imaginative and is an excellent fantasy of time travel.

Illustrated by MOREY

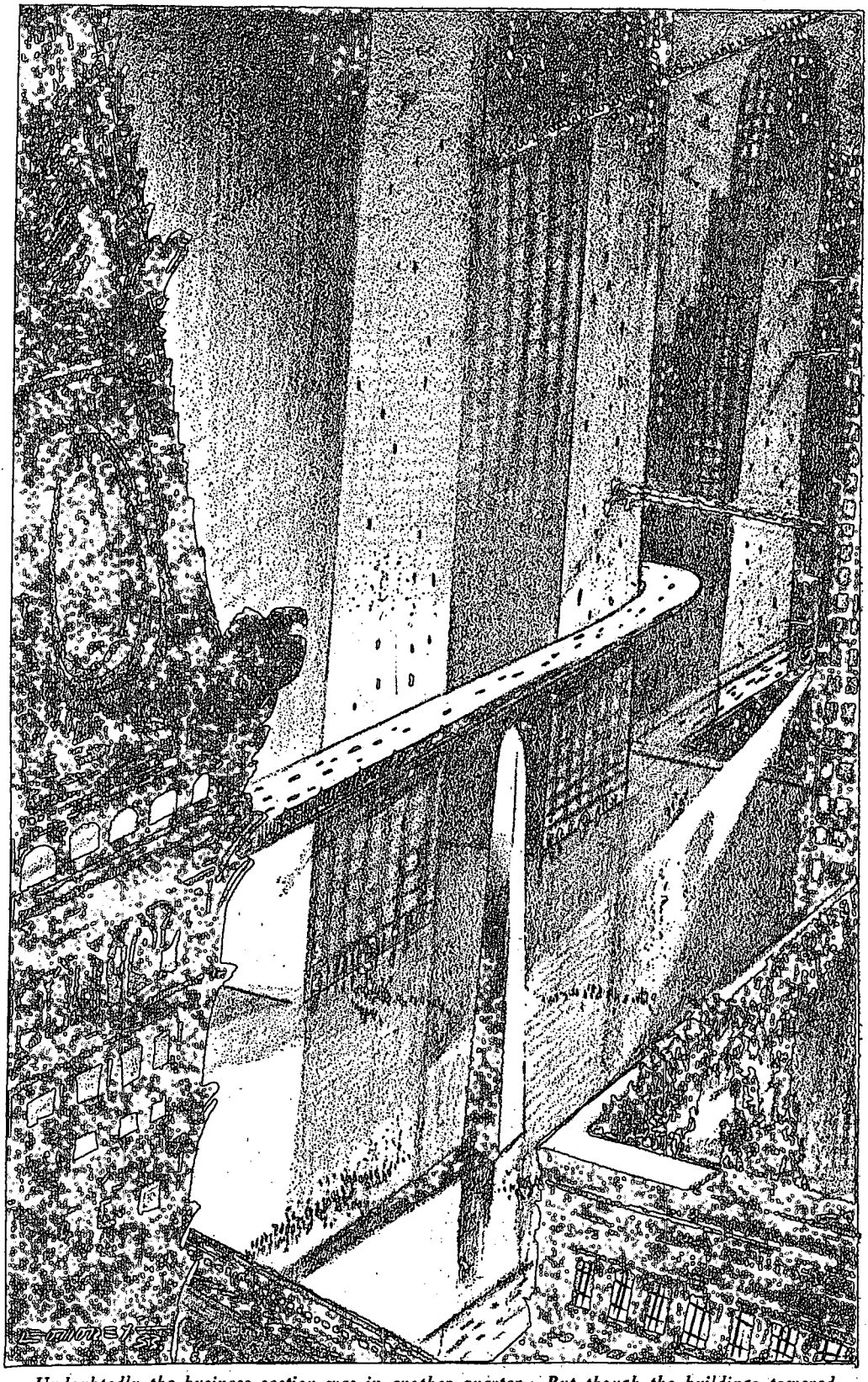
AT 11:23 P. M. on the night of May 6, two men carrying three large suitcases walked rapidly up to the base of the Washington Monument and quickly forced an entrance. They were Professor Lysander Green, eminent scientist, and Arthur Hayson, the most intimate of his small circle of friends, and they were upon a curious errand. In short, they were going to steal the Washington Monument. They proceeded at once up the many steps, and arrived at the top at 11:47 P. M. precisely.

"Open those two bags and get out what's inside, if you don't mind," said the Professor to his friend.

Hayson did so. He produced some blankets, which he spread upon the floor, some canned vegetables, bottles of water, cooking utensils, and a small "canned heat" stove. These he stacked in a corner, and then turned to watch Professor Green. The Professor had opened the remaining bag, and from it was carefully lifting a small and complicated piece of machinery. As far as Hayson could see, it might be almost anything. A tiny dynamo, minute but doubtless efficient, was connected to a maze of wires, transformers, condensers, and coils of many kinds, and these in turn were joined by a single wire to a heavily insulated box, the size and shape of an ordinary storage battery, with a small switch on the side. Hayson had an idea it might be a radio set of some kind and was leaning over to examine it more closely when Professor Green, looking up, said, "What do you think of it? I had to invent a name for it."

"Very interesting. Very interesting indeed. But what is it? And why are you bringing it here?"

"It is a temperator. It is the first temperator in the world, and it will probably be the last, for as far as I know there is no more material for another one. That



Undoubtedly the business section was in another quarter. But though the buildings towered above them to a height of three and four thousand feet, and for all they knew even a mile, one fact was soon apparent . . . what they saw was . . . one stupendous building.

is because it is made of meteoronium. Meteoronium is a very interesting metal. Extremely so. It has electrical properties that will surprise the whole world when I give out the secret of this little machine. As to why we are here? Tell me, do you remember the article that appeared in the papers a week or so ago, in which it was stated that I claimed to have conquered the secret of time? And do you recall the storm of satire and scorn that followed? Well, that is why we are here."

"Excuse me if I am dense, but I don't quite follow. What is a temperator anyhow? And I don't see how an article in the paper would bring you here."

"Of course you don't. But you will when I explain. You see, Arthur, you are probably the best friend I have, besides being a newspaper man yourself. That is why I invited you to help me in the great experiment I am about to perform. You trusted in me enough to do as I asked, even to breaking in here, without having any idea as to what it was all about, so it is only fair that I should enlighten you now and give you a chance to withdraw before it is too late. I warn you, it is going to be dangerous. How dangerous I can not even guess."

"THAT part's all right, professor. I wouldn't withdraw under any circumstances now, you have my curiosity so aroused, but I would like to have a hint as to what is going to happen."

"I was sure of that, Arthur, or I wouldn't have invited you in the first place. In brief, then, a temperator is a time machine, one of those things you have read about but never believed possible. And we are here to prove to the world that it *is* possible, and that I do not state a thing without being positive of it. You know how the papers ridiculed me, and how even my fellow scientists laughed. Very well, then, we are going to give them a jolt that will shock them into seeing the truth. We are going to steal the Washington Monument."

"WHAT? Steal the Washington Monument?"

"Precisely. I am going to steal, or rather borrow, the Washington Monument for a few days. When I return I shall make public the details, and people will be able to do nothing but believe. In no other way than the true one, will they be able to account for its disappearance, for the Monument is really quite large, as you can easily see for yourself by just looking out one of the windows."

"Well, Professor, all I can say is that you have quite a job ahead, if you are really in earnest. And how do you plan to make away with it? Load it into a truck and cart it away?"

"Really, Arthur, you are stupider than I thought. I shall not move the monument an inch. I thought you understood that, with the aid of my temperator here, I am going to transport the Monument into future time. Thus, as the Monument will be in the future, it will be as invisible as a house not yet constructed."

"OH, I see now. You mean we are to go touring into the future in this Monument, so that when we come back you can prove that you have really conquered the secret of time. Of course it was stupid of me not to catch your drift sooner, but I couldn't quite grasp the idea. Can you explain how it works?" And with eager interest Hayson bent over the temperator again. He noted the mass of wiring carefully, observed the unfamiliar appearance of the metal, and attempted to lift it, to find that it was extremely light. This was surprising to him, for he had expected something heavy. The Professor's voice brought him to his feet again.

"It is really rather difficult, Arthur, to explain. Even I haven't fully grasped all

the details yet, and I have been working on it for twenty years. Of course you know that for all these years, while you have been scribbling nonsense for the newspapers, I have been experimenting in my laboratory, and I have found out quite a number of things that no one else knows. This is one of them. What first put me on the track was the discovery of the metal meteoronium in a meteorite which plunged near the corner of my laboratory one night. I dug it out and took it inside and found that it was a lump of pure metal, unknown to us and not even oxidized on the surface, from the heat it had been subjected to in rushing through the atmosphere. I named the stuff meteoronium and made some tests with it. It is extremely light, weighs only three-fourths as much as aluminum, as a matter of fact, and wonderfully strong. It's melting point is very high, for only the electric arc will reduce it to a molten state. I suppose that is why it was not consumed while coming through the atmosphere. Really, it is a wonder metal. As far as I know it is not present upon the earth, and the spectrum does not show it to be present in any of the stars yet analyzed. It would be a great boon to mankind if it were to be found in large quantities upon the earth, but it isn't. This little in the temperator is all there is, and it is invaluable. You couldn't buy it from me for enough to pay the national debt of every country in the world.

"BUT it is the electrical properties of meteoronium that are the most wonderful. As far as I can learn, it emits radiations of a most peculiar sort. I have not been able to learn if these radiations are in any way like X-rays, or cathode rays, but I am of the opinion that they are entirely different. Just how, I don't know, but in some manner these radiations affect time. Time, I have come to believe, is a force or power of some kind, like electricity, about which we know nothing. It exists, but we are unable to do anything with it. But now I have found a means to control this time-force. When properly applied, electric currents sent through coils of meteoronium will set up a magnetic field which affects the time-force and causes it to be absorbed. I don't know the precise how or why, though I hope to find out some day but I know that it is so. Once while I was experimenting with coils of the metal, finding its electric resistance and so forth, the coils suddenly disappeared. I was dumbfounded, but of course the battery connection was broken when they vanished, and ten minutes later the coils reappeared upon the table as suddenly as they had disappeared. This set me to experimenting, and the result is the temperator. I have arranged it so that as the coils absorb the time-force, when the current is on, they store it in this time-battery. Of course, as the power of the machine forces the battery to absorb a great deal more time-force than it is ordinarily capable of, it will naturally release it as soon as it can. So to release the stored up time-force and return through time it is only necessary to throw this switch on the side of the battery case. Then the time-force is released through the coils in the same manner and at the same rate as it was absorbed. Another way would be to knock the insulation off the battery, but it would be destructive, for the enormous energy stored up would all escape at once and probably wreck the machine. This would be extremely sudden, and you would return through time hundreds of times faster than you had advanced. Of course, the coils themselves absorb a certain amount of time-force which they do not release, and so it is impossible to return to the exact minute at which you left. The difference will probably be a week or so.

"SO, if you follow me, you see that the temperator is capable of affecting the time over a certain limited area in such a manner that it will be removed and we will advance through time. This process is much like tearing down a stone wall to let you pass from one field to another. We tear down the time barrier that lies between us and to-morrow, or next week, or the next century. It is easily and quickly done, and I can control the force over quite a large area. All that is necessary is to start the dynamo, and at once we shoot through time. As soon as we stop the dynamo the time travel stops, and we are in a different time. It is quite simple, you see, my friend. And now are you still determined to come, knowing that something may happen to prevent us from returning from the future?"

The Professor's words had at first amazed Arthur Hayson, but soon the Professor's enthusiasm communicated itself to him and with even more ardor than to Professor Green himself. Hayson was anxious to set out on this amazing trip through time. "Hurrah for the temperator!" he shouted in an excess of enthusiasm. "Quick, Professor! Let us get started before someone comes to stop us!"

"Ah, that is the spirit, Arthur. You are right. We must get going. Some one may possibly have seen us enter and may attempt to prevent us from carrying out our experiment. We will commence!"

"And will we travel through time like the heroes of those stories that novelists write?" eagerly inquired Hayson of Professor Green. "Will we see the sun rise and set twice a minute and see buildings grow up around us and all that?"

"No, no. Nothing of that sort. It is only in the imagination of the authors that time machines speed up time so that the sun rises and sets so fast you can't see it. We will travel very differently. We are not going to travel through time, we are going to remove it from before us. We will be traveling in dead darkness and absolute quiet the whole time for we will be tunneling through this same time as we would tunnel under a mountain. But we will get tired and hungry, so after we have started we will sleep for a few hours, and then we will be fully prepared to face the future, in a new sense of the words."

With Hayson as an eager observer, Professor Green set about the task of starting the temperator. He carefully adjusted what he explained to be the power rheostat, and set the direction pointers which controlled the space to be affected by the rays. A minute or so sufficed for this, and he was ready to start the minute generator. It started with a hum as he threw the switch, and immediately the temperator sprang into brilliance like an electric light bulb switched on. Every inch of wire glowed brilliantly. Following the Professor's example, Hayson touched the wires, to find that no heat was noticeable. This cold light then must be the visible evidence of the rays that were even now shooting out into the space around them. The strange glow lighted up the little room at the top of the Monument, so that flashlights were no longer needed. But when he went to the windows Hayson could see nothing. Outside it was blacker than black. There was a total absence of light. A strange quiet was also over everything. The rustling of the trees, the moon-light upon the ground below, the night noises and sights, all had been utterly cut out. Hayson turned back to the Professor, strangely excited and elated. He had not known such a thrill in years. "We are off!" he cried.

"YES," chuckled the Professor, "we are off. I wonder what they will

say in the morning when they wake up and find their monument gone. There will be a great fuss, I have no doubt. But when we return there will be an even greater one."

"How fast are we going?" inquired Hayson.

"About a thousand years per hour. There are ten power stages, with the highest twenty thousand years an hour and the lowest one thousand years. We are on the lowest stage. It is my plan to continue at the same rate for about six hours, during which we can sleep. I don't want to get too far into the future before stopping, and I think that six thousand years will be a good length of time. We can shut off the power as soon as we awaken. What do you think?"

To Hayson this was a splendid idea, and he said so. In his exalted mood he would have liked to travel a full rate for hundreds of thousands of years, but he too wished to see what lay in the near future. (There would be time enough later to travel faster and farther. Before he fell asleep he made a mental calculation. There were supplies for several days, and fuel for the dynamo for thirty-five running hours. Twenty-five hours at twenty thousand years an hour, say, and ten at one thousand years, that would give more than 500,000 years.

"FIVE hundred thousand years!" he murmured ecstatically and fell asleep.

But the strange quiet had an unforseen effect upon the two men. Undisturbed by any noise but the hum of the dynamo, they slept longer than they had planned, and it was fully ten hours later that Hayson awoke and sleepily rubbed his eyes. He sat up and saw that Professor Green was already awake, was getting a meal ready. The Professor turned for a moment from his labors and tossed a cheery greeting.

"Hello," he said. "It's about time for you to be getting up. You've been asleep for ten hours. I overslept, too, and we want to stop as soon as possible, so come and help."

As he munched the meal, called breakfast for no reason save that their last meal had been supper, Hayson watched the glowing machine before them. Ten thousand years! To think that they were already in the year 12000! It took perhaps fifteen minutes to eat and clear away the scraps, which they did by simply throwing them out the window into some other time, and then they were ready for the great moment. Hayson took his position at one of the north windows while the Professor made everything ready. With a curious excitement stealing over him Hayson saw the professor throw the dynamo switch. The glow of the temperator died suddenly, and without warning a great glow of light and a mighty wave of sound rolled over them. The terrific suddenness, after the long hours of dark and quiet, staggered them both for a few moments, then as their eyes adjusted themselves to the light a wonderful scene spread before them.

BEFORE them was a mighty avenue, lined on both sides with a solid wall of giant buildings. As far as the eye could see the blaze of electric lights came from the windows of huge buildings stretching down the avenue into the distance. It was night, but so powerful was the illumination that at first their impression was that it was daytime. But it did not take them long to make out the true details. The light was coming from the windows of titanic skyscrapers surrounding them, skyscrapers that dwarfed the Washington Monument into insignificance as a giant oak would dwarf a match stick. The glaring of the lights made many things hard to make out. Daylight

would have given a much better view. But this much at least they were able to make out.

They were at the intersection of two great streets, presumably in the apartment section of the city. At least that was the impression that Hayson somehow received. He was convinced that these amazing buildings were not office buildings, as we have them now, but great hives in which the cramped humanity spent the night. Undoubtedly the business section was in another quarter. But though the buildings towered above them to a height of three and four thousand feet, and for all they knew even a mile, one fact was soon apparent. The fact was just this: what they saw was not a collection of enormous buildings, as it seemed, but one stupendous building. True, at different points the roof level varied hundreds of feet, but the whole mass was connected. At about every four hundred feet in height and every three hundred yards in length there were massive connecting bridges that joined the apartments on opposite sides of the street. These bridges served as a double purpose. They were both connecting links and supporting girders, a sort of flying buttresses. They were heavy, solid girders that joined the mass together in one solid pile, and so made great heights possible without the necessity for building in pyramid fashion, with many levels, each smaller than the one below. Thus, with a foundation that may have been easily six thousand square miles in area, it is perfectly possible that a great tower, which they saw three miles to the north, might have been of the stupendous height Hayson estimated, between three and four miles. To us it sounds wildly impossible, but remembering the conditions, there is no reason that it could not have been even higher. The use of the huge tower is more or less of a mystery. Hayson thinks that it may have served either as a signal and beacon tower, for a great light shone on top of it, or a lookout tower. Perhaps both. Either is reasonable, especially as there were swarms of aircraft about it.

BUT the attention of Professor Green and Arthur Hayson was directed more especially to the objects immediately around them. Directly to the north, a little above the level of their windows, and perhaps twenty-five yards distant, one of the connecting bridges was located. It consisted of both an interior passage, and an external one, the latter for foot travel only. Through one of the many windows in this structure Hayson was sure that he saw an automobile cross his view, and it is conceivable that there were indeed actual roads for vehicles within the great building. It is, in fact, most probable. Upon the pedestrian walk on the outside there were several persons crossing, and these were naturally greatly astonished when the huge stone shaft appeared suddenly. Most of them fled immediately, and probably reported the occurrence to whatever authorities there were, for it was not two minutes before a battery of searchlights somewhere on the top of the buildings was playing over the Monument. In another minute or two the bridge was crowded with spirits hardier than those who had fled. To them the monument must have been a wonderful mystery, etched out in blazing white as it was. Who can tell what their emotions were? Probably curiosity was among them. At least, it was not long before the crowd on the bridge was dangerously large, with more struggling to push their way on. From what he could see of them, Hayson describes them as being quite ordinary looking, not differing noticeably from the people of to-day, except, perhaps, that they were below the average size. Conflicting emotions gripped the two as they watched

the scene. All were wildly excited.

"Washington of the future!" cried Professor Green, in the wildest ecstacy.

"After ten thousand years!", shouted Hayson.

It is no wonder that they were overwhelmed, but it was not long before the Professor regained his customary calm.

"WE appear to have been placed in one of the streets of the future Washington," he observed. "It is lucky we did not happen to be inside of one of these buildings. I do not know what would have happened then. It is a danger I did not think of."

"And we seem to be attracting attention," added Hayson.

It was true. The near-by bridge was jammed with a pushing, shoving crowd of people endeavoring to catch sight of our hero and his friend. Already several persons had been shoved screaming over the guard rail, to plunge to their death in the streets below, without attracting more than casual notice from the others, so great was the universal excitement and curiosity concerning the strange apparitions. The number of searchlights played over them was increasing every minute, until the glare was so great that they had great difficulty in seeing anything at all.

"I wish they would shut off those blasted searchlights," growled Professor Green irritably. "I can't see a thing."

"What shall be do now?" asked Hayson.

"Wait until morning and make ourselves known to the authorities," said the Professor. "I think that if possible we will stay here many weeks. Time doesn't matter, you know, we can always return within a week or so of our departure. But the first thing to do is to let them know who and what we are. I'm going to drop a note. Somebody is sure to pick it up and take it to the authorities."

"But suppose they can't read your writing. It will probably be to them like very old English is to us, or worse."

"Then they'll take it to the authorities anyway. Here goes."

PROFESSOR GREEN leaned far out the window, and observing that as yet but few persons had gathered in the street, he waved to them and tossed a package he had prepared as far out as he could. It arched out and started to fall. One of the searchlights picked it up and followed it in its fall. Then suddenly from somewhere above them a new ray shot down. It was a glaring, eye-searing brilliance, as white as white hot platinum, Hayson describes it. It picked up the bundle and before he could realize it the bundle was gone. A tiny flash and a puff of smoke, and it was no more. Astonished beyond measure, they saw it vanish.

"The fools!" growled Professor Green. "What are they doing?"

At that moment the brilliant ray shifted and rested upon the base of the monument, then it started to move upwards. From below came a cracking sound of rocks splitting, and a wave of intense heat swept up upon their peering faces. Comprehension came to the professor first.

"Quick!" he cried. "It's a heat ray!"

"But what . . .?" began Hayson, puzzled.

"A heat ray!" the Professor shouted. "They take us for invaders and are bent upon destroying us. We'll have to leave, or that ray will be in the windows in a minute, and after that we'll go the way you saw the note go."

In a single leap he was beside the temperator and had thrown the dynamo switch. Even as the first wave of the terrible heat began to pour in, the welcome hum of the dynamo began. As though an electric light had been turned

out, blackness descended over them and the wonderful sight was blotted out.

HAYSON was dazed by the suddenness of it all, it took a minute or two for the full realization of their danger to percolate through his brain, then he gave a sudden gasp as he realized how narrow had been their escape. Suppose the ray had started at the top! Professor Green gave a sigh.

"Too bad! Too bad!" he murmured. I could have learned so much. But it was not to be. Oh, well, there will be other opportunities. What do you say, Arthur? Shall I turn on full power and run for a while at that rate?"

"Yes, by all means do."

By quick stages the power was increased until the little machine glowed like a living thing. The interior of the small room at the top of the Monument was lit as though by many electric lights, and the men could almost feel the powerful waves that were being emitted. These seemed to affect them in some manner. They began to grow excited. Both began to be impatient to go faster, but they could not. They grew restless, and eager for great lengths of time. They did not desire to stop, but wished to go on as far as they could through time. An hour passed then another, and another, but still neither made any suggestion that they should shut off the dynamo.

Suddenly Hayson shouted his feelings.

"Let us go until our fuel is gone! Let us not stop at these paltry lengths of time. What is ten, twenty, thirty thousand years, compared to a hundred thousand? Let us conquer a hundred thousand years, two hundred thousand, five hundred thousand! Half a million years! That is worth while! Why should we stop now? Let us continue!"

To this enthusiastic outburst, the Professor, also excited by the invisible rays, gave assent. He too wished for vast stretches of time. So for a full twenty-five hours, or until their fuel gave out, the two intrepid voyagers sped on through time at the rate of twenty thousand years an hour. They slept but little, so excited had they become. They were neither tired nor hungry. Evidently the time affecting rays has unsuspected exhilarating powers, like those of pure oxygen.

At last only a few drops of the fuel were left. Suddenly the Professor was struck with an idea.

"LET us carry everything down to ground level," he cried. "We can then observe what happens much better."

This was done, and with Professor Green bearing the precious machine, and Hayson loaded down with the other things, they descended the long flights of steps.

Hardly had they arranged everything at the foot of the stairs than the last drop of fuel was used.

Automatically the generator stopped, and, of course, the temperator. Their time flight was over.

With almost shocking suddenness light blazed about them. The two men rushed out into the open and gazed exultantly about them at the things they had come fully half a million years to see. They had travelled out of the depths of time to see—what?

As soon as their eyes were accustomed to the glare the men gave a gasp of surprise, or disappointment. They were in a dead world. They had realized that there would be many changes, but they had not been prepared for this. There was nothing. Absolutely nothing. Not a tree, not a shrub, not an animal, not a bird, not an insect. Only themselves. Underfoot was scorching white sand. Overhead a great, yellow sun slid across the heavens. That was all. As far as

the eye could see the sand extended to the north, west and south in gently undulating hills, fiercely reflecting the heat of the sun above. On the east was the sea.

The Monument was a few hundred feet back from the edge of a high, steep bluff, at whose feet waves were dashing thunderously. Save for these there was no motion or sound in the visible world. Sea and sand; that was all.

THE two men gazed about them with mixed emotions. Neither said a word, for their disappointment was great. They had expected to find a wonderful civilization, highly evolved men, great miracles of science, and instead they had come to what might have been a portion of a desert of to-day. But there was something else. Nothing tangible. They could see nothing, hear nothing, but they could feel something. A mysterious foretaste of some great event about to happen. They could not place the strange uneasiness that assailed them, or find a reason for it. But it was there.

Professor Green spoke first.

"Well!" he said.

For a time Hayson said nothing, then suddenly he exclaimed, "Do you feel it?"

"Yes," the Professor nodded. "I feel it."

"What is it?"

"I do not know."

"There is something great impending. Something terrible. I can feel it plainly."

Again the Professor nodded.

"What are we going to do?"

Professor Green considered. We have come far with great expectations, and I must confess I am disappointed. But something is going to happen. We will remain for a while and see what. Meanwhile we can formulate further plans. I am hungry. Let us eat."

Professor Green observed it first. The day had passed and the sun had sunken out of sight to give way to the great moon, blood red in color, that rose, almost at full, into the sky. Hayson was complaining about the heat, when he saw that the Professor was paying no attention, but had his eyes fixed upon the sky. Hayson turned to look also. The moon was a third of the way up from the horizon, but what was just rising above the horizon? Could the earth have acquired another moon? Another disc was rising slowly. A disc fully a quarter as large as the almost full moon itself, shining with a white light. But no, not a moon.

THE Professor murmured, almost to himself, "A runaway planetoid!"

"A planetoid? It seems to me a comet," remarked Hayson.

"No it is not a comet. For one thing it has no tail, and for another, it is shining only by reflected sunlight. If it were a comet it would be self-luminous," replied the Professor.

"You mean that it is a planetoid that has someway escaped from its orbit?" inquired Hayson.

"Yes, but not necessarily of the solar system. It is more likely to be some wanderer of space that has been attracted by our sun. In fact, that is much more likely than that one of the planetoids regularly circling the sun should have escaped from its orbit."

For several hours they stood there, gazing at the strange visitor. It had climbed to the zenith when Professor Green again spoke.

"It has grown larger!" he exclaimed sharply.

It had indeed. In the time it had taken to rise from the horizon to the zenith its diameter had appreciably increased.

"What does that mean?" asked Hayson.

The Professor's tone was serious.

"It means that it is rapidly approaching the earth," he answered.

"Well?"

"And the chances are that it will strike the earth in a very short time. In short, that body up there in the sky, probably deflected from its previous course by one of the other planets, has taken on a new one that will bring it and the earth together."

"And then what will happen?"

"Both the earth and the planetoid will become a flaming mass and will fall into the sun. It will be the end of our world!"

"What! You're not serious, Professor!"

"Indeed I am. Do you think I would joke about a matter like this? The only possible alternative is that this wanderer from space may strike the moon first, in which case both will be precipitated upon the earth, and the final results will be the same. And this will happen within a few hours. Look! it is larger already!"

"Then we have traveled to the end of the world!" exclaimed Hayson.

And they remained in awed silence until the mysterious visitor, now almost half as large as a full moon, set late in the dawn.

The day passed slowly. The sea was very agitated, but otherwise there was no evidence of the tragic drama rapidly coming to a close. The two men had resolved to remain till the last possible minute before discharging the time battery. In his scientific curiosity the possible fear of Professor Green was set aside, and Hayson, though with trepidation, agreed to remain until the end.

Finally the long day passed and the eager watchers saw the great red moon climb into the heavens. But now the other was before it, high in the sky before the moon appeared. Much larger than it had been, now much more than half as large as the moon. It was an impressive sight, but awesome, to the two watchers. The dread visitor, rushing towards them from the unknown depts of time and space, crossed the zenith just ahead of the moon, and always growing larger. Now the two were two thirds of the way down to the horizon. It was evident that the end would be soon.

BUT now the forces of nature were rising in anger. Stirred by the unwonted approach of the wanderer, the earth was quivering and shaking slightly. From time to time a heavy shock ran through the ground, shaking the men violently and causing the Monument to quiver. The sea receded gradually until the waters were out of sight and the beach lay exposed for miles, but still the men watched on.

Now the planetoid was hidden from sight behind the moon itself. It was plain that the two would collide first, before the planetoid crashed into the earth, and both together would fall. Five minutes. Ten minutes. No longer.

But it was time to be leaving. When the crash came the great heat would crisp and sear everything upon the earth, leaving it dead before the final act in which it would itself become a ball of flame. Professor Green was reluctant, but at that instant nature herself forced him into precipitate action. A heavy quake shook the earth, and the Monument quivered like a reed. A great crack opened in the earth at his feet and swiftly widened, while from the sea a roar was heard as a great tidal wave swept in. The Professor leaped towards the Monument. Hayson was already there. The whole top of the cliff upon which they stood was beginning to slide towards the oncoming wave even as he got to the temperator. With one swift jerk he threw over the switch on the time battery. Even as he did so there came the first great crash as the titanic wave swept against the face of the cliff and broke almost upon them.

But he was too violent. With scarcely any resistance the little switch tore loose from the battery and flew from his hand. *He could not lose the time!* There was a split second of utter despair and lightning-like thought, then the Professor acted.

Even as the outflung spray of the tidal wave swept about his heels, he lifted high the precious time-machine, and with almost a sob flung it with all the force he could exert upon the stone floor.

IN the second that it smashed both men saw in the sky a terrific blaze of light that covered the entire heavens as the deadly visitor and the moon locked in fiery embrace, and a frightful gust of heat crisped their skin, then with terrific suddenness darkness swept over them as the time battery insulation knocked off, released the stored up time at an enormous rate. And then Hayson, who had stood transfixed like a figure in a tableau, fainted.

Perhaps half a minute later he opened his eyes to find Professor Green bending over him. Outside he could see the full moon drifting across the sky, with a multitude of twinkling stars around it. A soft breeze drifted into them, and he saw the trees sway gently. The thought came to him that it was all a dream, these terrible things he had seen, only to be dispelled by the Professor's voice.

"That was a close thing," Professor Green was saying calmly.

"It was indeed, Professor," Hayson answered, getting to his feet, ashamed to have fainted. "I feared we would not make it. What now. Shall we tell the world all this?"

"No,, Arthur, we can't. Much as I regret it, since my first object was to make public all that we might see, we must preserve silence. The machine is gone. Somehow it slid through the door when I broke the time insulation, and without it no one would ever believe. Even I can scarcely credit the things we have seen. And too, we should either be jailed for what has happened, much to my regret, to this noble monument, for it is fully two hundred feet out of position, and badly cracked, or else given a nice padded cell in some asylum. If I had the machine . . . but regrets are useless. What is done is done. Come. We must be going."

"Have you the bags?"

"They were empty and I threw them out. We are ready now."

"Then let us go."

And a moment later the two disappeared in the darkness.

THE END

When the Universe Shrank

Serial in Two Parts—Part One

By J. LEWIS BURTT

The author is a favorite with our readers, as well as with the Editors, and here he has contrived to introduce an atmosphere of suspense and excitement into a story of interplanetary adventure. The first part appears in this issue and we are sure that it will leave our readers in a state of expectation, so that they will await with great interest the concluding portion which will appear in the November issue.

Illustrated by MOREY

THE change began to be observable about the year 2930 (old reckoning). About that time it became patent to all that there was a rapid increase in size occurring in all forms of animal life. All living bodies seemed to be equally affected, even those which had already reached their normal maturity.

This phenomenon was inexplicable, especially as only living beings were affected, and the research bodies of the world were utterly at a loss either to account for or to check the development.

By 2945 the matter had become serious. The population of the earth had already increased almost to saturation point, and now the problem of world starvation faced us, for although our numbers had not increased, yet, in a period of fifteen years, the stature of man had nearly doubled and, consequently, his bulk had increased nearly eight fold. Where were we to get the extra food? Our reserves, which had been stored for generations, were fast being depleted and we could not look to the other planets for help, since they too were experiencing a similar growth.

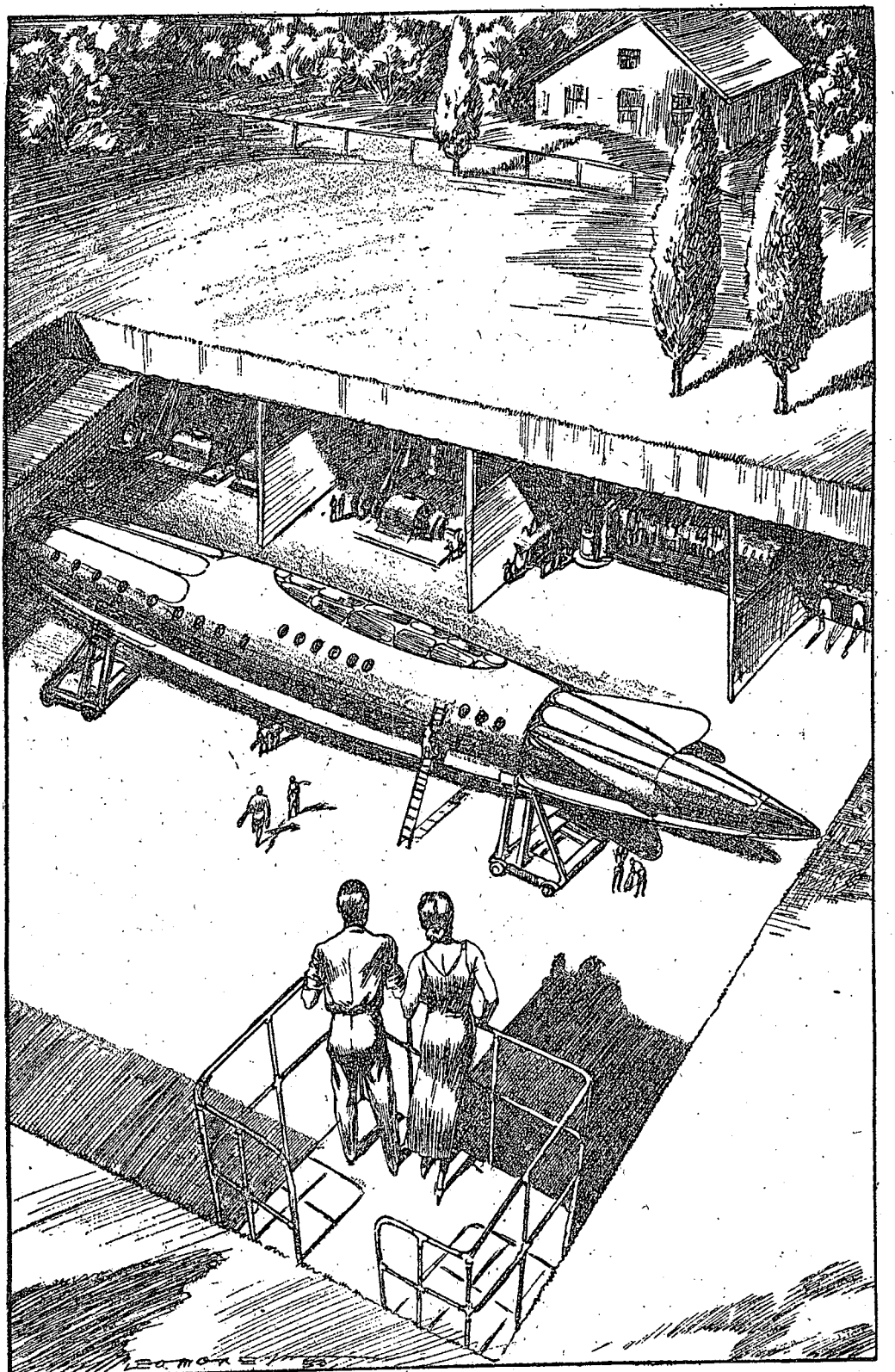
Clearly the phenomenon had a cosmic cause.

From 2935 to 2945 the Interplanetary Council followed the usual procedure of talking, suggesting, arguing (or perhaps "squabbling" would be a better word) and giving out reams of useless and contradictory advice.

At last, however, in 2945 the representative of the little satellite, Io, a man of powerful intellect, rose up in the midst of the Council and *demanded* that his plans be tried out.

"HONORABLE Councilors," he said in that memorable speech of his, "we have talked for a decade while the Solar System creeps steadily nearer to starvation, yet not one of us has even suggested an intelligent plan of salvation.

"The worlds are tired of our talk and demand action. I therefore demand—yes, ladies and gentlemen, I *demand*—



It sank for about twenty feet and then slid sideways under the ground, revealing a huge pit around which were a number of work-shops. The greatest surprise of all, however, was the beautiful chrome-plated, cigar-shaped space yacht which lay on her cradles in the middle.

that this Council call on the peoples of the worlds, that they make public the truth and let all, who have possible solutions to offer, be asked to submit their plans to their national councils who in turn will submit the best plans to us."

"Yes, young man," countered an old Venerian, "but do you want to start a panic that will wreck civilization?"

"There will be no panic," the young man replied calmly, "we shall only be telling them what they already know. And even if there is," he added seriously, "better that than years of slow and hopeless starvation."

"Oh, my friends," he pleaded, "let us trust our peoples, let us for once admit our impotence and open the way that the inevitable leader may come forward—for humanity's sake!"

The written words sound very ordinary, but the intensity of pleading behind them stirred that council beyond speech. Feeling the thrill of inspiration, the Speaker rose.

"Friend of Io, here from a little world comes wisdom, as so often in the past good has come from the little nations. I do not need to call for a vote. I know it is the unanimous will of this Council that your demands be complied with. Let this, then, be our proclamation, broadcast now to the worlds:

"We, the Supreme Interplanetary Council, authorized by His Highness Egbert, Hereditary President of the Solar Worlds, hereby notify the peoples of the Solar System that unless some means of checking this strange growth, or some means of multiplying our food supplies, can be found within a few years, we are doomed. Our worlds must perish.

"We therefore call on all the peoples of the Solar System to meet this crisis as men and women should. In addition, we call on all who have understanding enough to offer intelligent suggestions for the amelioration of our fate, to submit such to their National Councils for transmission to us."

The excitement caused by this proclamation did indeed come near to panic, but the danger was not immediate, there was still food for some years to come, and so the saner elements prevailed.

An astrophysicist was the first to throw light on the cause of the change. A young officer of the Terrestrial Interplanetary Navy, who was studying astrophysics, unearthed some old documents, among which was a pamphlet by that ancient wizard, Einstein, in which, backed by mathematical evidence, was the statement,

"Although the universe is at present steadily expanding and increasing in size, yet in the astronomically near future it will cease to expand and will enter upon a period of shrinkage."

Now the old astronomers had recognized this to be true, but they had calculated that this expansion and contraction was a matter of distances between stellar systems and of that only. They also assumed that in speaking of "the astronomically near future" Professor Einstein had meant a period of hundreds of thousands of years. In other words the accepted idea was that during millions of years the suns would gradually get nearer together, but at so slow a rate that no human agency would ever detect it, except through delicate instruments. At any rate it would not concern the ordinary life of mankind.

This young man, Neil Cameron, however, made a number of calculations, making use of the fact that the speed of light is invariable under all conditions in empty space, which showed that this contraction was already in progress, and that not only were the worlds rushing together at an appalling rate, but that they were also undergoing an actual shrinkage in themselves. This shrinkage he explained as being due to the alteration of inter-

atomic forces, causing planetary electrons to fall towards their nuclei to some extent as the universe contracted. For some unexplained reason the contraction did not affect living organisms, which consequently remained as large as before.

IN other words we were not growing at all, but our worlds were shrinking under us—we were only larger relatively.

This statement of Cameron's aroused the usual storm of controversy, disbelief and scepticism, especially among the older astronomers, but the arguments were so sound and the proofs so convincing that, finally, the theory had to be accepted as proven fact.

Here at least was a partial explanation, but it didn't seem to be of any help in solving the practical problem. It did, however, offer a ray of hope. Neil Cameron's figures, as finally accepted, showed that this shrinkage would continue until the worlds were about one thirty-fifth of their original volume (there was no very great diminution of mass so that gravitational pull on the inhabitants was not seriously altered). This meant that their surfaces would shrink to less than a tenth of their original productive capacity and new sources of supply must be found to balance this.

The reduction of the spaces between suns was, however, going on more rapidly, and when the contraction was completed, distances between solar systems would average less than thirty light-days instead of three or four light-years. What the consequences of this would be no one could foretell.

This dramatically rapid change seemed to be contrary to all astronomically known laws, for such changes usually take millions of years. Yet here it was happening in a space of less than forty years altogether—a mere instant in stellar time.

Again it was Cameron who gave the explanation. The universe, he had explained, had been in a form corresponding to that of a gas. Now if a gas is allowed to expand freely, it cools and with pressure will collapse suddenly to a liquid. This was exactly what was taking place in the universe. The solar systems, corresponding somewhat to the molecules of a gas, had expanded so rapidly (doubling the volume in a mere million years or so) that they had reached the point of condensation, and were now rushing together in a process corresponding to that of liquefaction.

He assured the peoples that there was no danger of actual collisions between systems, but he could not say what other forces might come into play. He felt confident, however, that after the instant of collapse (this little matter of forty years) things would adjust themselves on a new and different, but extremely stable basis.

However, this didn't solve the food question, and there the matter hung.

DIANE sat waiting in the ante-room of the great Council Chamber. After all it was rather a trying ordeal for a young graduate, even if she did belong to the finest college on the North American continent.

The door opened. An officer appeared.

"The Council will speak with you, Miss da Silva."

Nervously she followed the officer into the great hall and up to the great chair before the Speaker's throne.

"Miss da Silva," commenced the Speaker, "we have considered fully your suggestion that the oceans be drawn off into space and their beds be fertilized and made suitable for the production of foods. This Council at first thought that there was a suggestion of possiblity in your idea, and we have to tender you our thanks for offering it. The idea, however, was submitted to the leading astronomers and physicists and they have

definitely stated that it is an utter impossibility. We regret therefore that this Council can not act on the suggestion."

This dashing of her hopes was like a blow in the face to poor Diane, whose expression showed the keenness of her disappointment.

The Speaker, however, continued with a half-smile:

"Notwithstanding this, we have a request to make of you. One of our younger astrophysicists, Commander Neil Cameron, of whom you have doubtless heard, disagrees with his even more learned colleagues. In view of Commander Cameron's recent work in discovering the cause of our troubles, we are disposed to regard his clearly expressed opinions with very deep respect.

"Commander Cameron has requested this Council's permission to absent himself from all duty for an indefinite period so that he may further investigate your proposals. This request has been granted, and also his further request that you be invited to remain in the capital and collaborate with him in his work."

The sudden reaction from utter disappointment to encouragement was almost more than Diane could take in on the instant. Her face was a study in bewilderment.

She turned to the Speaker,

"May I have a little time to think this over?" she said. "These rapid alternations from 'impossible' to 'possible' are somewhat confusing."

She was conducted to a little sitting-room, where she was left for a while to straighten out all these contradictory opinions.

After some little time a knock came on the door and, at her bidding, a young officer entered. He came over to her and she looked up into a pair of deep brown eyes set in a handsome face and surmounted by a crop of dark, wavy hair. The concern in those eyes was genuine and unmistakable. It was real indeed.

"I'm terribly sorry that absurd Council bungled things so stupidly, Miss da Silva," said the owner of the eyes. "I'm Neil Cameron, you know."

"Oh!" she exclaimed, her pretty, oval face lighting up with surprised pleasure, "I'm so glad. It's good to meet the one man who apparently has some faith in my ideas, however impractical they may be."

"It's good of you to put it like that, Miss Diane," replied Neil. "It makes me feel even more certain that our work together is going to be a pleasure—of course you're going to accept the proposal, aren't you?" and, at her nod of agreement, he went on, "I surely do have faith in your idea, perhaps because it's the only possible one I've heard, perhaps because the 'old fogies' are so opposed to it, perhaps—may I say it?—because of the charm of its originator."

"Commander Cameron," came back the smiling reply, "these pretty speeches are very charming, but haven't we work to do?"

"OH! sure," was his ready return," "but need business be devoid of pleasure? I want us to be friends—real friends. And seriously," he went on, "I do think your idea holds possibilities—slim ones no doubt—possibilities overlaid by tremendous difficulties—yet ever since I read the outline of your scheme I've had a curious feeling that somehow you've found the only possible way."

"That, coming from you, is high encouragement. Shake!" She held out her hand impulsively to his warm and friendly clasp.

"These rooms," he went on to explain, "have been set aside for us and our assistants by the Council, but I think I should prefer to use my own laboratories and observatory at my home in England—that is, of course, if you are agreeable.

"By the way, my mother wishes me to

extend her welcome to you and to say that her home is at your disposal, if you will honor us by accepting our hospitality."

Diane's acceptance of this offer left no doubt as to her keenness. "But," she asked, "how about funds? Has the Council—"

"No, Miss Diane, the Council has *not*," was the rather disgusted reply, "but fortunately my mother also believes in your project and has placed at our disposal all we need for everything. No," he went on seeing her look of hesitance, "don't fear to use it. Remember it is for the worlds, not for ourselves."

"But how generous!" she exclaimed.

"Oh! I don't know—perhaps," countered Neil, "you see, mother and I have more funds than we can ever use, and setting aside a little matter of half-a-million eagles is really rather a relief."

"Half-a-million! Why—"

"Why, yes, it'll take all that and I fancy several more half-millions as well. To be perfectly candid that's all that's the matter with that Council. They know we've a chance, but they do hate to spend money on other people's ideas.

"Listen," he went on abruptly, "When we've won this battle with Nature we'll be powerful enough to get rid of that idiotic, doddering bunch of wind-bags. We'll set up a dictatorship—a good one, for the benefit of the people—a man like President Egbert, say. All this democratic nonsense has been proved a failure for the past thousand years. The peoples are no more free, under what they call democratic forms, than they were under the ancient Egyptian Pharaohs—they *think* they are, but—" he broke off suddenly. "Here, I mustn't start pestering you with my pet hobby."

"But," she pleaded eagerly, "that's just my idea, too, though an insignificant and impecunious girl like me never dared to talk such heresy."

He laughed, and she went on,

"But Neil—I may drop the formalities, mayn't I?—you thrilled me terribly then. Why did you say 'we'? Are you going to let me help you in that, too?"

"Would you like it?"

"I'd love it! But I suppose the other problem comes first, doesn't it?"

A COUPLE of days later they were settled down to work. The problem was immense. First of all there was the main problem of overcoming gravity sufficiently to draw off the oceans far out into space. Then there was the question of driving this mass of water—a little matter of some 55×10^{18} (thirty-five million, million, million tons)—into an orbit so that it would continue to revolve around the earth as a new satellite. In addition there was the problem of preventing it from freezing solid, so that it would be available for use as required. It was calculated that at least ten percent of the water must be left on the earth's surface in order to give sufficient evaporation area to provide a rainfall, as well as sufficient for the tremendous irrigation projects that would be necessary.

To allow for seepage into the earth, diffusion out into space, etc., it would be necessary from time to time to replace loss with water from the new satellite, hence the necessity for keeping it from freezing.

A further problem was presented by the possibility of earthquake, volcanic and batholithic disturbances due to the alteration of the stresses imposed on the earth's crust when the weight of the oceans should be removed.

Altogether it was a neat little problem for anyone to tackle. No wonder the Council turned it down.

Both Neil and Diane were excellent mathematicians, but even so they spent a full three months calculating out the forces necessary, the strains to be allowed

for, etc. This task alone would have been impossible without a staff of a dozen assistants, who were kept constantly busy on their calculating machines or making practical observations of various sorts.

Meanwhile the shrinkage continued. The change from day to day was imperceptible, but over a period of months a distinct difference could be detected.

All seemed to be working out smoothly. Not a hitch occurred during this period of calculation, and at last it was over and the full immensity of the task lay before them.

The figures appalled them. Forces unbelievable would be required to hurl this stupendous mass of water out into space. Where were these forces to be found? How, when found, were they to be harnessed?

The two young scientists looked at one another in silence, their one thought "Impossible!" clearly expressed in both faces.

Slowly Neil stretched out his hands and clasped his partner's. No words could he find to express his disappointment, as he shook his head in a slow gesture of uselessness.

For a long time they stood thus, their eyes searching each other in a gaze of understanding friendship, a friendship that bade fair to be the basis of an even deeper feeling.

At last Neil spoke, almost in a whisper,

"I'm sorry, my dear."

AGAIN silence, deep, vibrant silence, held them. Then, with a half-despairing sob, Diane put her hands on Neil's shoulders, stared into his eyes with an intensity that was startling, and whispered,

"It *can't* be impossible! There *must* be a way!"

Then, as though the words had called the stupefied brain back into activity, she went on eagerly.

"How much money is there, Neil?"

He thought for a moment—hesitated—then said,

"I don't know. There's a great fortune, but only mother knows just how great it is. Everything rests with her."

"How much will she give us?" was the next demand.

As she spoke, a gentle voice from behind her asked,

"How much for what, child?"

Diane turned and threw herself into the arms of the dearest little old lady and held her close for a miinute, then,

"Dear Mother Cameron, just how big is that generous heart of yours? Our task looks impossible even to us, yet somehow we can't give up hope, can we, Neil?" she appealed to him, "but the half-million you've already given us won't go anywhere. We'll need far, far more. How much can you give us, Mother dear?"

"Half-a-million!" exclaimed the little Lady Cameron in a tone of disgust. "Did that young scamp tell you I'd set aside that much?" Then as Diane nodded in further disappointment, for she feared the amount was altogether beyond the facts, "Don't take any notice of his nonsense. I distinctly told him he could have ten millions a *month*. Now cheer up, Diane, there's plenty after all."

"But—" she hesitated.

"Well?"

"But even that is useless. We'll need —oh! I daren't begin to figure *how* much—" she broke off.

"What's our limit, mother?" broke in Neil, "Don't keep the poor girl in suspense any longer."

"To tell the truth, son, I don't really know myself. Your father left an immense fortune, and we've not spent one-tenth of the interest on it. Let's go to my little room and do some counting."

AS they reached the old lady's sanctum Diane made as if to withdraw.

"Don't be absurd, child," was Lady Cameron's admonition. "This is no secret from you." Then in a whisper, "It'll all be yours some day—when you're really my daughter—No, don't tell *him* what *I* know, he'll find out in time." And deliberately ignoring the girl's flaming cheeks, she led her into the little room.

For an hour they figured. Then the old lady took the various totals and added them all together.

"Well, will six and a half billions be enough?"

Startled at the immensity of the sum, Diane gasped. Then she threw her arms around the old lady with, "You darling, and you'll give it *all* to us?"

"Well, of course. What good's it going to do any of us if we don't fix these foolish worlds up?"

But Neil looked grave.

"It's a lot of money, mother," he said after a moment. "We must be the richest folks in the whole Solar System, but even that may be too little."

"Well, start on that, and when that's gone we'll get some more," she replied.

For two months more they, and a small army of workers, continued to wrestle with the great problem. The rainfall and irrigation projects were comparatively easy. The problem of putting the oceanic mass into an orbit, after its elevation into space, was, theoretically at least, comparatively simple. But the main question, that of actually lifting the water, proved completely baffling.

There was not enough power available on the earth, neither was there means of concentrating that power in the necessary way. Only one possibility remained—to find some means of nullifying gravity. This, so far, had proved entirely impossible and, not only so, but there seemed nothing leading towards any possible method.

Meanwhile the worlds continued to rush together. The great star, Sirius, formerly several light-years away, was now within half a light-year. So close was it that careful observation of its movements showed conclusively that it was a complex system consisting of two suns, one brilliant, the other dark and extremely dense (this had, of course, been known for centuries), surrounded by a group of at least three planets.

What if these planets were inhabited! What if their inhabitants, in desperation, should attack our system!

The suggestion was laughed out of court. How could they? Even half a light-year is too immense a distance to cross with a navy.

But *was* it so impossible?

The new casts insisted on the absurdity of the suggestion, but after reading some of the reports, Neil said suddenly one day at breakfast,

"Diane, I don't like it."

"Don't like what, my cooking?"

But he was too serious for joking just then.

"Don't like the approach of Sirius. Somehow it's menacing." Then, after a minute or so, "I'm going to have a look-see. Want to come?"

"Come? Sure, but where?" These sudden impulses of his always gave her a thrill of surprise, even though she was used to them by now.

"Out into space, of course. Where else? Are you game to sneak off with me for a cruise half-way to Sirius if necessary?"

"Sure I'm game, but in what? There isn't a *spliner that can go that distance."

"Oh, yes there is! Come along and I'll show you my big secret."

LIKE a couple of mischievous kids they stole off through the grounds, coming at last to a clearing in the park.

* Slang for "space liner."

where there was a smooth grass plot some three hundred yards square.

"Now watch," he said as they halted by a big elm tree, "See what you think of this for camouflage."

So saying he pulled on the bark of the tree, which swung open, revealing a cavity containing a tele-dial and a number of switch studs.

He clicked over the tele-dial switch and a man's face appeared.

"O. K. below, Fred?" he asked.

"Yes, sir, all starred."

"Right," and Neil switched off.

He waited a few seconds and then pulled over another switch. There was a faint, whining noise which rose until it became inaudible. Then, to Diane's astonishment, a section of the grass plot, some two hundred yards square began to sink.

It sank for about twenty feet and then slid sideways under the ground, revealing a huge pit around which were a number of workshops.

The greatest surprise of all, however, was the beautiful chrome-plated, cigar-shaped space-yacht, which lay on her cradles in the middle of the pit.

An elevator ran up to meet them. They entered and, as they descended, the roof swung back into place above them, leaving no trace at all outside.

A middle-aged man dressed in mechanic's overalls came up.

"Well, Jock, how is she?" was Neil's query. "You know Miss da Silva, don't you?"

"She's fine, sir," was the reply. "She's all ready to go to Mars with you any minute, sir."

Diane looked puzzled—a little annoyed—who was this mysterious "she" that was so anxious to go to Mars?

The next order solved the mystery.

"O. K. We'll need her tomorrow—but not for Mars. Fill her tanks, every one of them, with that new nitropicrite fuel. Better put in some extra tanks too. Fill every available space with fuel and provisions for a cruise to Sirius."

The old mechanic looked at him.

"Man, you're crazy. It's not possible."

"Can't help it, Jock. Crazy or not we've got to go—Don't say a word, though. No one must know about this."

Then, having fixed that, he took Diane's arm and led her across to the space-ship.

"Like her?" he asked.

"*Do* I? She's perfect. What's her name? You know I'm almost jealous of her, she's so beautiful."

"You needn't be Diane. She *is* beautiful, but at that she'd be jealous of you, if she were alive."

"Don't be silly! What's her name?" countered Diane, a little embarrassed. This paying of compliments was a new phase for Neil.

"Well—I hope you won't mind—but I thought of calling her the 'Lady Diane'. May I?"

"That really is a compliment. I'm afraid I can't refuse that. It really is sweet of you."

"O. K. then. Let's go aboard."

THE "Lady Diane" certainly was a marvel of designing, even though in general plan she followed the regular designs of ordinary space-yachts. From the tip of her needle-like nose-piece, right along the shimmering length of her polished chromium hull, to her after rocket tubes, she looked what she was, a veritable interstellar greyhound groomed for a long course.

Her tapered length of three hundred feet made her look slim and light, despite the fact that she had a forty-foot beam.

Diane looked at her namesake for a minute. Then,

"Why the elaborate streamlining, Neil? It's no advantage in space is it?"

"I'm not sure," he replied. "At the

speeds she can travel there may be some resistance even in what we call 'empty' space, and anyway it gives her more speed when she's in an atmosphere—not to mention the advantage in appearance," he added with a whimsical smile.

On board all was already ordered confusion. Jock had got the crews to work emptying the fuel tanks and refilling them with the new high-efficiency fuel. Another gang was busy overhauling and polishing the beautifully designed rocket-motors and all the auxiliary equipment.

After a glance at the engines, they went up to the control room, which was placed right forward in the transparent nose. From their seats before the control panel they had a direct view over more than a hemisphere, while by an elaboration of mirrors, vision in other directions was secured, so that they could see in every direction, either on direct or telescopic vision, without even turning their heads.

Neil motored Diane into one of the massive padded chairs set before the panels, and took the other himself.

"Think you can handle her?" he queried, "The two panels are exactly alike—every control is duplicated and this master switch"—indicating it—"throws in either or both. If both are coupled in, the starboard panel takes control over the port, so long as this pedal is pressed. That, of course, is to ensure a definite over-control in case of emergencies.

"All indicators, mirrors and telescopes are duplicated too, but the telescopes are capable of entirely independent action under all conditions."

Diane shook her head slowly.

"I can handle any 'spliner' the Interplanetary have in the system, but this—why there are at least a dozen new gadgets."

"Oh! you'll soon get on to it. Look, this is——" and he launched out into an explanation of the various controls and instruments.

Some time later a mechanic came up rather hesitantly.

"Excuse me, sir, but Her Ladyship has phoned three times to say that lunch is getting spoiled."

"Lunch is——? Goodness, look at the time!" exclaimed Diane, "I'd no idea!"

THEY left early next morning. Only two persons had any idea where they were headed for—Lady Cameron and Jock McBain—and very few others even knew they were away at all.

Lady Cameron, old as she was, begged hard to be taken along, but withdrew her pleas, when Neil explained that taking food for a third person meant so much less fuel space, that the success of the expedition might be seriously endangered.

They expected to be away for ten or twelve months, but, in case of emergencies, they carried supplies for ten years, including sufficient air and water conditioners for double that period. The rest of the ship, with the exception of the engine and control rooms and two small cabins, had been converted into a series of fuel tanks, every cubic foot of which was filled.

Their rockets would give them an acceleration of eighty units (the ancient foot per second being still used as the unit) which was more than anyone except the most highly trained space veterans could stand for any appreciable time. At this acceleration their fuel was sufficient for four thousand hours (say five months) *continuous* firing, using two hundred gallons an hour. In addition sufficient was carried to last the automatic steering tubes for ten years average use (these tubes, of course, were used very little, since once a course was set, they were practically only operated for the automatic avoidance of meteorites).

Once well clear of the earth, they swung to their course, a huge elliptical arc, which would bring them into the vi-

cinity of Sirius in about five months. They figured on using an acceleration of about fifty till they had reached twenty thousand miles a second—above which speed the relativity factor becomes too large for satisfactory acceleration—then drifting for a period, and finally decelerating at the same rate as they approached the star.

At their maximum speed their meteor detectors would, of course, be almost useless, but out in free space the chances of their striking anything were very small, and even so their long, needle-like prow would probably deflect them. Still, that was a chance that always had to be taken in space.

At first, existence to them was almost unbearable. The high acceleration nearly doubled their weight, and the drag on their internal organs was very close to the danger limit. Neither of them was susceptible to space sickness, but at such acceleration even the strongest suffer. The worst feature was, as always, the illusion of infinite time, which invariably makes these periods so much more terrible.

After the first few hours, Neil, seeing how the strain was telling on his companion, eased the rockets to thirty-six, which was comfortable.

"Why?" asked Diane rather testily.

"Don't think it's wise to carry so much strain," he replied, "We're more use alive than dead."

"But," she objected, "we'll never get there at this rate."

"Oh, yes we shall. We're not going to keep this rate. We'll increase the acceleration half a unit every hour till we get back to fifty—that way we'll get used to it more easily. It's going to be bad at that, and——" he hesitated.

"Well, what?" she asked, still very curtly.

"Well, there's one thing we *must* watch. The effect of the apparent time drag is to make us irritable, and unless we guard ourselves very closely we'll be murdering each other before the week's out."

"Oh, I'd forgotten that," she responded, "I suppose that's why I was so annoyed when you slowed down just now."

"Exactly. I felt my own temper rising for no reason at all, and remembered the danger."

"Well, thirty-six certainly feels better than fifty," she sighed out. Then with a swift return to gaiety, "Let's eat. I'm hungry, and besides I just *have* to look over the stores."

"Stores are O. K.," he replied, "We've plenty of everything to take us to the Great Nebula if necessary."

"So *you* say, young man. Fixed 'em your own self, of course!"

"Sure I did. That's why I know."

"Hmph! Sounds like a man," she scoffed. "Can we 'run automatic' for a while?"

"Think so. We've been out seven hours—speed 240 miles a second—distance about three million—R A. 75—Dec. 216—Yes, I guess we might as well."

A half hour's inspection and investigation of the stores changed Diane's scepticism into openly acknowledged approval. There seemed to be such vast amounts of everything from salt and pepper to canned oranges and turkey.

After Diane had made a thorough examination, Neil opened a small door in one of the storerooms. Behind it were two cupboards, one marked "Diane" and the other "Neil."

"What's all this?" she asked.

"Just a last minute idea of mine," he grinned. "Here's a key—opens both doors."

FILLED with curiosity Diane inserted the key in the lock marked with her own name, and opened the door.

"S-a-y, but——!" she began, "How *did* you know all the things I specially like? Look at that! And m-m-m—Martian mat-berries. I'm crazy about them. You're a real dear."

"Was rather an idea, wasn't it? Just a small supply of the things we each like best?"

"But how'd you find out exactly all my favorites?"

"Tell you some day—maybe," was the cryptic reply. And that was all the satisfaction she could get.

For some five days they accelerated, most of the time running 'automatic.' Their speed by this time was approaching four thousand miles a second.

That afternoon (they kept Greenwich Mean Time, of course) Diane suddenly turned to Nell with,

"Something wrong?"

"No, Di, Why?" he replied puzzled.

"I don't know, but I'm scared, there's danger ahead."

"That's funny," he answered back, "I've been feeling like that too. Anyway," he went on, "there's nothing to be done about it, is there?"

"I suppose it wouldn't be any use keeping a watch, would it?" she ventured.

"N-no. I don't think so—Well, maybe at that we'll feel better if we do. At least it'll break the monotony."

"I'll put some form of a detector screen out ahead as far as I can, and—Yes, I will—I'll try to fix up some sort of an odd weapon. Foolish of me not to have thought of that, wasn't it?"

"All right, then, Neil. I'll take first watch—three hour shifts?—while you get dinner and fix the gadgets."

About five or six hours later—Neil had forgotten all about either time or dinner, and Diane was still at the panel—Neil called out,

"I've got a beauty, can you come here a minute?" Then, seeing how cramped she was after such a long spell at the controls, he realized all and exclaimed,

"Oh, my dear. I'm so sorry. I quite lost track of time."

"That's O. K., Neil," she replied, "But what's the big idea?"

"Look!" he said indicating a dial, which he had just connected up to the panels.

As he spoke he threw over the control of a rheostat and, as he did so the needle moved over the dial, stopping eventually at the figure 1200.

"What's it mean, Neil?"

"Each unit on the scale is one hundredth of an astronomical unit—say about a million miles—which means that our detector is focussed about 1200 million miles ahead of us."

"But how? Surely that's not possible!" she exclaimed incredulously.

"Does seem rather a tall yarn, doesn't it? Fact is I'm kind of tickled with it myself. I'm using two etheric waves of slightly different frequencies. Where the vibrations are in phase, or nearly so, any material body passing through the wave causes interference which deflects the galvanometer. An alteration of current-flow of less than a millionth of an amp. will cause a deflection, so we should be able to detect any body whose mass is more than a thousand tons, so long as it is within the range of the instrument."

"We get the speed by timing the oscillations, which occur every half wave period, which is about every 10,000 miles of approach."

"But how d'you get the distance, once you're within range?" she queried.

"Approximately only. Just reduce power till there's no kick, and then step it up again till the needle begins to oscillate. Then read the distance directly on the dial. It's only very rough on account of the speed of the wave travel.

"This other dial, which is connected to the chronometer circuit, gives the speed

directly in number of miles per second."

"But how'd you get your wave to come back?" she persisted, determined to understand the thing properly.

"Well, that's a bit of a mystery to me too. It's a thing I stumbled on by accident. Oh, no! I didn't think all this out just now. It's been seething around in my head for months, but I never could see any practical use for it."

"Let's try it out right away," Diana went on enthusiastically.

"O. K.," but let's eat first—supper's been overdue some time."

After testing the "detectograph," as they called it, on a few known objects such as asteroids, they set it for maximum distance straight ahead and spread over a cone of ten degree angle. At the same time they reduced acceleration, both on account of their premonition and also to give them a rest from the strain.

There was no need to watch the detectograph for four hours or so. It would take time for the wave to travel out and the return impulses to get back.

Diane was on watch next morning when she noticed a flickering of the indicator needle and called Neil over for confirmation. He swung the ray off its direction for a while and returned it to its original direction. After a couple of hours the needle became stationary and remained so for a period corresponding to that during which the ray was deflected. Then it becan to oscillate again.

A FEW hours feeling around with the ray established the course and position of the strange body fairly accurately. They estimated it to be a body of from five to ten thousand tons mass, approaching the Solar System at about two thousand miles a second and about nine hundred million miles from them.

"If it weren't for this hunch, I'd say it was just a meteorite, in spite of its great velocity, but as it is, a body of that mass on a course between Sirius and the Sun looks mighty suspicious," was Neil's viewpoint.

"Let's watch him a while," suggested Diane, "If he's a meteorite his course and velocity will not vary. If he's a spaceship he'll show acceleration, unless he's just coasting."

"Brainy idea, Di. Let's do that," agreed Neil. "Meanwhile no acceleration for us. If we coast for a day we'll get better readings. Shove over the artificial gravity switch, will you?"

By midday they had pretty well decided that the stranger was just a wandering meteor, but after dinner the readings began to show a little variation, and by five o'clock that night it had become obvious that the stranger was approaching with diminished velocity. Diane, who was using the calculator, looked up.

"He *was* coasting. Now he's decelerating at about forty, which proves him a 'spaship,' and I'd say he's spotted us too."

"Looks like it," agreed Neil. "Sirian probably. Wonder if he's friendly or not. May be looking for new worlds to colonize, if they're overcrowded like we are. In which case——"

"What'll we do, skipper?"

"Say, any more of that skipper stuff and you go out the space-lock. This is a partnership, isn't it?"

"Yes, I know," agreed the girl, "But you've had so much more experience in things like this."

The result of their conference on the matter was that they should decelerate at a rate sufficient to stop them about the time they got close to the stranger, who apparently had the same idea.

Of course at such speeds it would be quite impossible for them to see each other when they got near, and until then, they were too small to be visually detectable anyway.

On the morning of the fifth day after spotting the stranger they had practically

come to a standstill, their speed (relative to the Solar System) being less than a thousand miles an hour. The stranger was now definitely visible in their twelve-inch reflector as a tiny sphere from which projected forward streaks of flaming gases. Obviously he too used rocket propulsion and was still decelerating.

Suddenly Diane turned to Neil and said,

"Suppose he's hostile, shouldn't we try to warn the planets of their danger?"

"Uh?" he exclaimed in surprise, "How in space can we! Over a million miles to transmit it! Have a heart!"

"Well, maybe we can't, but, my dear, we can at least try. Of course no wave we can send could possibly penetrate the heavyside layers of the planets, but some patrol cruiser *might* pick it up."

"It's an idea all right, Di," he agreed, "we've got to try. Our batteries are up to full charge after using the tubes so long, so we've lots of power to send with."

NEIL'S ship was one of the first to be equipped with the "anstromag" batteries. These were charged by means of a thermocouple arrangement from the waste heat of the rockets, a device that not only provided plenty of power for the auxiliaries such as lighting, heating and etherograph, but used up the heat radiated from the rockets, which sometimes became too hot on long runs and damaged their firing nozzles.

"Let's see," he muttered, "Work the calculator for me, will you, Di?"

For four or five minutes he shot figures at her in a bewildering gaze, his fingers flying from page to page of his book of tables. Then he sat back with a sigh of relief.

With scarcely a pause Diane ripped off a slip of paper from the machine and handed it to him with—

"Guess we can do it after all. What'll we send?"

"Quick work, Di," he approved.

"How's this?" she asked after a few minutes.

"H M H M—Neil Cameron and Diane da Silva, Space Yacht 'Lady Diane,' Position 16.3 . R. A. + 73 . Dec 216° . Course + 0.26 same direction. We are coming in touch with spherical space-ship from direction of Sirius. Believe it to be scout heralding possible attack on Solar System. Advise immediate preparation of maximum defence fleet. H M H M."*

"Too long?" she queried.

"No, that'll be short enough in Universal Code. Take control, will you, while I transmit?"

The stranger was by this time within twenty thousand miles of them and, like themselves, practically stationary.

After a few minutes Diane called.

"Visitor seems to be stationary. Please get me his size and distance on the mass-range-finder."

This was a complex device designed by Neil's old commander—almost his foster-father—Captain Freeman. It was not yet in general use, Neil having this one really for testing purposes.

"O. K.," he responded to Diane's request. Then after a few seconds,

"I make him about five thousand tons mass, diameter say fifteen hundred feet and distance about eighteen thousand."

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* The ancient SOS . . . — — — . . .) was still used as the distress call for individuals and ships. For a general warning of danger to shipping or to the system generally, the signal HM HM (. . . . — — — . . . . — —) was used

Declination and Right Ascension correspond to latitude and longitude and are set by arbitrary lines in space drawn from the sun as centre, Radial distance is distance measured radially outward from the sun in microparsecs—the old Terrestrial astronomical unit, the parsec, is Interplanetary standard.

Course is given as follows: the first figure relates to travel compared to the ecliptic (in non-technical language the plane of the Solar System) measured in degrees, plus and minus directions being arbitrarily determined. The second figure gives the direction corresponding to the declination.

Acceleration is given in the ancient British feet per second, the metric system having finally gone out of use.

Velocities are given in Interplanetary miles (1830 yards) per second.

"Good enough," she replied. Then, suddenly, she reached up and pulled the master switch, plunging them instantly into unutterable darkness and cutting off their artificial gravity, so that they floated slowly towards the centre of the ship.

"What's wrong?" asked Neil anxiously, as they drifted together and clung to each other.

"Just a hunch. Sort of felt his observation on us and thought we'd hide a bit. He'll not see us now, nor will he be able to detect us electrically with everything shut off. Give us a few minutes to think things out."

HOWEVER, a few minutes later they had decided to go on as before and let the first move come from the other ship.

Their heaters and lights on again, Neil went behind the control panels and made a number of connections.

"There," he said as he finished, "that ought to help a little. If he shoots any ray stuff at us now we ought to know about it before we get burned up."

"But you can't etherograph through it," objected Diane.

"No, that's the trouble. When I'm sending you'll have to cut the screen out with this switch. If he shoots at us there's an automatic trip on it, but I don't know if it will work or not. It should throw on the screen in time to catch any rays—provided he doesn't get us too hard on the first jolt," he finished rather soberly.

For another three hours there was no alteration of conditions, each ship seeming to be wanting the other to make the first move. During this interval of waiting, Diane handed over the controls to Neil and, to cheer them up a bit, got a meal consisting chiefly of "specials" from their little locked cupboards. Then she came and sat by him while he ate his; right at the panel.

While they were eating they discussed their plans of campaign, finally deciding that, since their enemy might be any sort of a being, they would do best by waiting for him to move first. That way they hoped to get some sort of idea as to his capabilities before they got into battle. By this time they had definitely concluded that he was hostile, and so they decided to keep on sending out their warning message.

After supper Neil said to his companion,

"I'm afraid you'll have to navigate for several hours now, Di, if you can. I want to get that weapon fixed up. I'm sure getting careless in my old age," he went on, "I should have had all these things done before we started, but somehow I never thought of meeting any enemies out here.

"You know, Di, it's lucky you know so much about space-navigating, and doubly lucky you've learned so much about this boat in such a short time. Now I feel I can leave her to you in any emergency."

"That being so," countered Diane, rather pleased at his praise, "do you think you could leave her entirely to me for a bit now?"

"Why, of course, Di. But what scheme are you hatching now?" he answered, suspecting from her mischievous manner that she had something she was going to spring on him.

"Well, only that I'm going to set a few alarms, so that our friend can't start anything without giving us a hint. Then I'm going to run an 'automatic' for a couple of hours and give the motors and controls a thorough overhauling. Then we'll *know* we'll be all right if we have to use all our power."

"But *can* you, Di," he asked, "It's a pretty tough job for a girl, you know."

"Sure I can," was her confident reply,

"Haven't I watched you do plenty of overhauls of one thing or another. "Besides," she went on, "I can always call you if there's anything I can't manage."

"It sure would be a good thing, and——" he paused for the right words. Then failing to find them, ended with, "Gee, Di, you're a *real* pal!" Which, after all, in Diane's opinion, were exactly the best words he could have said.

DIANE had nearly finished checking over the motors when Neil called to her,

"Come and see what you think of this."

"This" was a contrivance something like those ancient bullet projectors still to be seen in museums, and known to our ancestors as "machine guns!" That is, it was like them in outward appearance, except for a heavy cable attaching it to the batteries.

"Now watch!" he continued, "And for goodness sake, don't get in front of the thing."

As he spoke he aimed the gun at a sheet of high-resistance magna-metal, and slowly drew back the release. There was a brilliant flash. A hole appeared melted clear through the tough metal and nearly through the heavy fire-proof plate behind it!"

"Gee!" she exclaimed, "That's some weapon!"

"Wait awhile, my dear," was the rejoinder, "You haven't seen anything yet. I only used one notch of powder—about half of one percent! If I let that gun out it should be as effective at fifty miles as it was just then at twenty feet."

"How're your motors coming along?"

"Be through in about half an hour, everything, 'double starred' and ready for heavy duty."

"O. K.," he commented, smiling up into her grimy face, "I'll get breakfast while you finish. Then I'll need help in rigging up these three guns outside."

"Breakfast!" she exclaimed in surprise.

"Yes, breakfast. Do you realize that our couple of hours has grown into twelve. Time we ate, isn't it?"

A few hours later they were back on regular watches, still waiting for the enemy to make a move. Neil continued sending his warning call every five minutes, as they slowly drifted nearer and nearer to the other ship.

Suddenly they looked at each other. Diane shot out the ray-screen with all the power they had.

"Did you get it too?" they exclaimed simultaneously.

"Yes, but the ray-screen has checked it," was Diane's comment.

Both had felt in that moment a definite, worldless, mental command to "Stop sending that message!"

The surprise of it had, of course, resulted in their obeying it. They had to figure out how to handle this new development.

After a moment or two Neil said thoughtfully, "My dear, I think we can handle that all right. It's a form of mental domination that our forefathers called hypnotism, an evil practise long since fallen into disuse. I learned from the old writings that it is powerless to dominate those who resist it, who refuse to allow its suggestions to control them.

"I'd keep that ray-screen out to help, but I can't send through it. I must cut off the screen and keep on sending until we're forced to fight, so we'll have to keep our thoughts constantly alert to *refuse to listen* to his suggested orders."

"O. K. Neil. We'd better watch each other too. We may be able to help if one or other weakens—if the mental battle becomes too fierce," was Diane's wise addition.

Off went the screen.

Out again went the message of warning.

Again, with still more force, came the order, "Stop that!"

They continued unheeding.

"STOP THAT!" came the command with almost overwhelming force.

Neil's hand hesitated on the signal key, but only for a fraction of a second as Diane's clear voice rang out, with all her thought behind it.

"Keep on going Neil. *Keep on sending!*"

For interminable minutes the battle continued, but eventually their combined efforts began to win and the strain of resisting that mental attack gradually lessened, until they found that they could keep control without difficulty.

At the same time the strain was great and they felt the point of exhaustion coming nearer.

Then the message changed.

"Stop that message or we cut you to pieces!"

With all the power he could concentrate Neil sent back the mental challenge,

"Try and make us!"

However they knew they must soon stop sending, for the enemy was now drawing close. He was within a few hundred miles, and they knew that they would soon need their screen to prevent annihilation.

"I'll send twice more and then close the screen," was Neil's decision.

Diane, unable to speak, nodded her agreement, and Neil continued his sending, only now he began and ended his message with the personal cry for help—S O S.

But could there be any help? What chance was there that help was near? Not one in millions!

Just as he was finishing the last message, Diane suddenly leaned over and threw the switch controlling the ray-screen.

"What is it?" asked Neil.

"He sh[illegible]t a ray at us. I saw it just as it hit us [illegible]nd threw out the screen. That automatic never worked at all."

"Quick work, kiddo, you saved us that time!"

"Look" she exclaimed, "It's terrible, but isn't it marvelous?"

There about two miles away, between their ship and the enemy sphere, was a most wonderfully beautiful, transparent, orange glow, shading away to dull red at its edges.

"Yes, my dear," Neil agreed, "It *is* beautiful. I'm thankful to see it that color too. He's got to heat it a lot more than that before there's any danger. It'll go to blue-white or even violet before it burns out the activators."

"I'm going to try our heat gun on him. Wonder what *his* screens are like!"

AS he spoke he trained a gun on the enemy ship and pulled back the control to its limit. There was a flash of sparks from the condensers as they took up the load. Then, close to the enemy, appeared a dull-red glow, which gradually brightened and glowed through yellow to a brilliant white.

"Gosh!" he exclaimed, "Got his screens into the white already, and at this distance too! He's either holding out on us, or else our armament is better than his. Wonder what sort of a screen that it. It's different from ours, not so transparent."

"Don't take any risks, Neil," was his companion's caution.

"You'd better figure on a few surprises. I fancy, though, that our resistance to his mental efforts surprised him more.

"Can you get through his screens?"

"Not from here, but if he comes closer I think I can, and before he gets through ours I hope."

Hour after hour this silent battle of forces raged. It seemed that neither side

was gaining anything. Our friends could not coax the enemy into effective range. Neither could they get away from him. His control was perfect. Diane tried everything she could think of, she threw on full acceleration, he backed away instantly—she shot around in as close a curve as they could stand, he followed them as if chained to them—she jerked from side to side, he copied every movement.

Then she had a new idea.

"Neil," she called, "We've only one way left to get closer. Let your gun-ray begin to lose its intensity. Let it appear as though our power is failing. I'll let the rockets miss fire a little at the same time. Maybe he'll fall for it."

For a short time their ruse seemed to be ineffective. Then they found their screen beginning to creep up the spectrum into the bright yellows and whites, indicating that their enemies were either using more power or getting closer.

They drew him on gradually until their screen had reached a definite violet, indicating a temperature sufficiently high to be near the limit of the screen's resistance. Then, with a warning "Now!" Neil threw back his release and the gun shot out its limit of power.

For an instant the enemy's screen flashed through blue-white to violet. Then it went dark.

With the swiftest movement they had yet seen, he flashed away from them to safety.

Neil turned with a grin, "Burned him some, I guess! Got through his ray-screen anyhow. Didn't he hop back though!—Wonder what sort of motors he uses and what sort of folks they are, who can stand that acceleration."

"No good wondering, my heroic child," commented Diane from the control chair, "We're likely to find out quite soon if we're not mighty careful—Oh look!" she broke off.

OUT from the side of the sphere there flashed a spinning ball of golden radiance. Slowly it seemed to approach them, yet they knew that actually it was travelling at terrific speed.

For a second they both gazed in wonderment, then—

"For God's sake dodge it!" came Neil's voice, harsh with excitement.

But even as he called, Diane realized the danger and flung the ship to one side. Now the menacing ball would pass to one side of them. But——

"Neil, oh Neil! look!" she almost screamed, "Look! it's *following us!*"

Frantically she dodged, turned, twisted, in an effort to avoid this new terror and to give Neil a chance to use his guns on it.

It was useless. The ray-gun made no impression on it. Steadily it approached. Now it reached the ray-screen—passed through it unharmed!

Diane, her wonderful courage strained to breaking point, locked the controls and got up from her seat. They could not avoid it, so they might as well meet it.

Neil slipped an arm round her, while with the other he still played his gun on the thing.

"It's finish, I guess, my dear," she whispered.

"Yes, I'm afraid so," he replied, "I don't know that I mind so very much going out, as we're going together. You know I love you, don't you dear?"

"Why of course, dearest," she whispered back, "Hold me close when the end comes, won't you?"

For a minute they held each other very close. Then, with a sigh, Neil muttered, "It would have been nice to know that the worlds had got our message, wouldn't it, dear?"

"Yes, Neil," she answered, "but somehow I feel they have."

Helplessly they stood awaiting the end. Together they did not really fear the

passing, but the uncertainty as to the fate of their message was the one thing that seemed to torture them. Had they failed, or had their message done its work and saved their worlds?

Gently the glowing ball touched the side of the ship. They braced themselves for instant annihilation, but—*nothing happened!*

Amazed, they waited. Then——

"Surrender, or we'll disintegrate you and scatter you through space," came the thought wave, "This ball can be exploded from our ship and will utterly annihilate you and your vessel. Make up your minds quickly."

What must they do? The question was in their eyes as they looked at each other. Was it not better to die defiant than to surrender and perhaps be forced to give information to their enemies?

The word of defiance was on Neil's lips, when Diane's exclamation checked it.

"My dear, we're wrong. We must surrender."

Uncomprehending, he stared at her.

"Don't you see. If we surrender we've still a chance—a possible chance to learn something of their armament and plans—a barely possible chance of getting information to our peoples. If we're killed we've *no* chance."

"But suppose they *force* us to give *them* information?" he queried.

"They can't, dear, I'm sure of it. We know we can resist their mental forces, and if it comes to—" she hesitated with a little shudder—"if it comes to physical torture, we can endure that too. But there's a way out of that too," she continued with a sudden brightening of her voice.

"O. K., dear," was Neil's agreement. Then out to the enemy he sent the thought, "All right, we surrender."

Back came the order,

"Get into space-suits and leave your ship. We will give you an hour."

At least they took it to mean an hour, the time interval impressed on their thought giving them that impression, and, too, it was a reasonable interval.

Sadly they commenced their preparations.

"What did you mean, Di, by a way out of torture?" asked Neil suddenly.

"THIS," she replied talking a little compact from a pocket of her handbag, "Dad always insisted that I carry there, ever since the Venerian pirates captured the old "Marventer."

Opening the little box she shook out two tiny silver balls scarcely a twentieth of an inch in diameter.

"Put one of these in your mouth," she instructed, "Work it gently in between two teeth so that it will look like a poorly set filling. Make sure it won't be noticed if they should open our mouths, but arrange it so that an ordinary bite will not break it—it's fairly tough—strong enough to stand ordinary strains.

A little careful manœuvring and adjustment, and they each had one of the tiny pellets securely imbedded in their teeth.

"Now," Diane continued her instruction, "If the worst happens and we can endure no more, all we have to do is to bite down suddenly and *hard* on them to break them. The death they contain is instantaneous."

"Shall we set a time bomb to blow up the ship after we leave?" asked Neil next.

"They discussed this for a few minutes but finally concluded not to do it, feeling that the enemy could not possibly get any valuable information from the ship, and that so long as it remained, there might still be a bare chance of their escaping in it, just how, they couldn't say—but while they had it, something *might* turn up.

So they finished their preparation, indulged in one long embrace, locked on their space-suits and floated out into the void.

Slowly they drifted towards their conqueror, directing their movements by means of tiny reaction pistols.

After what seemed an age they reached the space-lock of the great sphere and pulled themselves inside.

The great valve swung closed and, after a while, an inner valve opened, admitting them to the interior of the ship.

"Do not remove your space-armor," came a warning—a warning that was totally unnecessary as they had no intention of doing such a thing until they had ascertained the conditions prevailing in their new abode.

"Come straight forward to the centre of the sphere," was the next order.

Carefully they made their way along the corridor into which they had emerged from the space-lock. The gravity on board was very light, even with their heavy space-armor, they weighed less than on earth.

There was no sign of any living thing in the corridors, but whether this was favorable or unfavorable neither dared surmise.

By allowing their helmets to touch they were able to talk to each other although their voices were somewhat distorted.

"What do you make of it, my dear?" came Diane's voice through the helmets.

"Haven't the faintest idea, sweetheart," came back the reply, "I suppose we'll come to some of them presently. Wonder what they're like."

The corridor extended for some four hundred feet. Then, as they reached its far end, a door slid open in front of them and they entered a big spherical chamber, obviously the centre of the vessel.

The space around the circumference of this chamber was filled with controls and machines, whose purposes were completely unfathomable. A narrow alleyway let through the maze of machines towards the centre, and along this they carefully made their way.

As they emerged from the forest of mechanism, they stopped, dumbfounded.

JUST what they had expected to find neither could have said, but they certainly were not prepared for what they did see. Geologists have always told us that the chance of two different systems producing life forms that are similar, is only one in countless billions, yet here before them was a definite refutation of all the thousands of years of theorizing.

The creatures who stood in the centre of this vast machine were *men*—men like ourselves! There were differences, truly, but minor ones only. In size they were very little smaller than Earthmen, perhaps a little larger than Martians, but broad and massive. Their color was a most peculiar greenish purple, a color strange to our eyes yet, curiously enough, not at all unpleasant.

But it was their eyes that fascinated the two earthlings. They were a peculiar luminescent yellow, seeming to glow with shifting lights—something, yet not quite, like the eyes of a cat seen in the near darkness.

Whether they were fortunate or not in finding beings of their own form neither could say. They were relieved to find beings whose form they could comprehend, but on the other hand, they remembered just how inhuman men of our own form could be on occasion.

In front of the commander's seat they stopped. A Sirian came forward. As he did so the commander sent the thought:

"Allow my officer to take a sample of your air. If it is suitable we can converse much better with those clumsy space-suits opened."

A few minutes determined that the at-

mosphere of the Sirian ship was breathable by Earthmen, and so they removed their helmets. They found the Sirian air unpleasant at first, but it was endurable, and after a while they became accustomed to it. Later they found that it was very similar to our own atmosphere but contained only about fifteen percent of oxygen and very little nitrogen, the deficit being made up chiefly of argon. The temperature was also higher than that of earth and the air was extremely humid. Still, as we said, they could breathe it without actual discomfort or danger.

When the prisoners had removed their helmets, the Sirian commander demanded, speaking unintelligible words but conveying the thoughts mentally.

"Who are you and from what world do you come?"

Quick as a light ray came back Neil's reply, "Why should we give *you* any information?"

"Because we can compel you to," was the answering thought.

"Compel *us?*" Neil threw every bit of derision and contempt of which he was capable into that defiance.

"Diane, standing close beside him, whispered, "Oh good boy!" Then directing her thought to the Sirians, "Fools! Don't think you can *scare* us!"

"There are other ways!" came back the malignant suggestion.

"What other ways?" returned Neil contemptuously, "Don't think anything you can do will make us tell anything we don't want to!"

At this defiance the Sirian's eyes seemed to redouble their luminosity. From him there emanated a series of thought waves of terrific power, waves intended to break down their resistance, waves which suggested horrors unthinkable, tortures unimaginable.

For what seemed hours the silent battle raged. Diane and Neil, standing as close to each other as possible, fought grimly and determinedly. Now and then doubt and hesitation would shake one or the other of them as the mental pressure was concentrated in that direction, but each time the increased attack on the one partly relieved the other. Each time, therefore, that other was able to give support with the reminder, "We beat him before, we can beat him again."

Once when the Sirian concentrated his supremest efforts to break down Neil's resistance, Diane saved him with the plea, *"Hold on,* Neil dear, remember that Right is Might!"

FROM this time on, the awful pressure relaxed. The Sirian apparently accepted his defeat. Ceasing his cruel efforts, he sent out a new thought, a thought of compromise which seemed to say, "I cannot break you, so I am reluctantly compelled to yield you my respect. Let us exchange ideas and give information for information."

The sudden release from strain came as a dazing shock. For a moment they seemed to be in a whirl of confusion. Then Neil's mind cleared.

"Look out, Di!" he warned, "It's a trick! There'll be another attack!"

Sure enough there was. Scarcely had the treacherous thought of compromise been put forward, scarcely had they time to react to it, when, following it, there came a thought so hideous, so terrifying, so crushing in its force that for a moment both of them were shaken.

Then, as an answer to their unvoiced prayers, there came to them the inspiration, "Good cannot be conquered by evil. Right is *invincible!*"

As one they hurled this thought, with all their strength at their tormentor. Instantly they felt his attack grow confused, weakened, out of focus.

Realizing their opportunity, they held firmly to that thought that neither

doubted came from the infinite Source of all Power.

For a full minute they held their ground, every instant growing stronger. Then, finally, the enemy, his power broken, his efforts exhausted, surrendered.

This time they knew it was no trick. They could feel the surprised dread that the Sirian was experiencing, and they knew that justice had indeed conquered, that malice had again been proved powerless against honor.

Afterwards, in recalling that struggle, they wondered why all those others had not added their efforts to their leader's attack, why only the commander himself fought the battle. For a long time they puzzled over it, until one day an old Martian philosopher solved the problem for them.

"Why, of course," he told them, "the explanation is simplicity itself. These people are undoubtedly able to concentrate and unite their mentalities, so that what you actually fought was the combined attack of all the beings in the vessel, directed and focussed through the commander."

The old Martian paused—thought for a while, "It must have been a wonderful fight," he commented rather wistfully, "I don't believe any but those who were truly united in mind, united in a great love, could have won it."

Now that the enemy's attack was broken, the opportunity for negotiation lay with the Earthlings. Without hesitation, Neil sent out a thought,

"You know now that you cannot break us to your will, but since for the moment we are in your power physically, we will consent to negotiate with you. *But we* agree to no *demands*—understand that," the substance of the message. The time for that was over.

As he delivered it, he realized that, in some strange way, he was voicing Diane's thought as well. In fact from that time on, in all their dealings with their enemies, these two invariably thought as one being, so close were they in understanding and friendship. All through this period their unity of thought was intensified, yet for some reason they could not explain, their thoughts were invariably transmitted to the enemy by Neil, never by Diane. Her idea was that it was the result of his masculine instinct to protect her from any harmful contacts—a sort of shielding her from the nauseousness of the attacks.

For some time the Sirian remained silent, sending out no thoughts, although they could sense that he was turning the matter over in his consciousness.

At length he seemed to come to a decision.

"We agree," was the thought that came, "Let us first, as a basis for negotiation, exchange thoughts telling each other what we are, whence we come and what are our life-purposes."

"We agree," was Neil's response. "After ten of our hours we will again meet you here," a stroke of genius this keeping the initiative. "At the moment we desire rest and food. We will accept your assurance that you will not interfere with us mentally or otherwise during this period, which we shall, of course, spend in our own vessel."

Assurance was given without hesitation and both felt that, despite the fact that their enemies were so peculiarly constituted mentally, they could trust that assurance.

THE two tired people were not long in returning to their "home" and in divesting themselves of their clumsy armor.

Once again cuddled down in her lover's arms, Diane's overstrained fortitude gave way. With a sob like that of a tired child, she burst out, "Oh Neil, darling!

I'm so frightened. It's all so terrible. I'm sure it'll send me crazy. We're so utterly hopeless."

Tenderly he kissed away the tears, whispered soothing words of comfort into her ear, until after a while her sobs ceased.

Exhausted now, but reassured, she looked up at him—saw for the first time the unutterably wearied, drawn expression of his face.

"Oh you poor old thing!" she whispered, "Here am I being a baby, when all the time you need comforting as badly as I do. I *am* a selfish little beast!"

"Hush, dear," he whispered back, "You know that's not true. You needed the comfort and help more urgently than I did. You just *had* to break down or else go mad. I was able to hold on by reason of my years of disciplinary training. But——" he broke off with a shudder that racked his whole frame, "I guess I'm all-in too," he ended feebly. He too had reached the limit of human endurance.

For a long time they just lay and tried to rest. The strain on them had been almost more than man could endure. They were completely exhausted mentally and physically as the result of the battle. They seemed to be in a daze, as though the power of coherent thought had gone from them. After a while, however, they began to recover and, in an hour or so, dropped off into a sleep from which they awoke feeling once again able to cope with the circumstances.

Their next interview with their captors was of a more interesting nature. They still felt the mental antagonism against their foe, but it must be admitted that the Sirians kept their bargain, and in exchange for an outline — carefully worded so as not to divulge vital information—one of the conditions of human life, they gave a fairly comprehensive ided of their own worlds.

As our astrophysicists had figured, their system consisted of a double sun with a system of planets, four altogether. They were suffering from the same calamity that had brought about the difficulties on earth. Their already overcrowded planets, shrinking under them, had left them desperate for food.

Their planets were similar to those of the Solar System, although, since Sirius is a much hotter and bigger star, its inner planets are hotter and have denser atmospheres. The world from which these particular beings came was somewhat larger than the earth, but, being less dense, the gravity was less. Being used to traveling to the other planets, however, they had become accustomed to considerable variation of conditions and so were able to stand much greater differences than were Earthmen. This, of course, accounted for the remarkable way in which they were able to manœuvre their vessel; they could stand accelerations that would have killed Neil and Diane.

They admitted that they were scouting in the direction of our Solar System in order to find more worlds to live on, and feeling certain that the prisoners could not get away, were not at all hesitant about giving away information—though Neil noticed that they carefully avoided any direct information about their armament, except to keep putting forward the suggestion of its invincibility.

At the close of the interview the Sirian commander gave them a thought that jolted them rather badly. Unintentionally Neil had convinced him that our system included worlds suitable to their constitution.

The result bade fair to be calamitous. He gathered the impression that they were going to turn back to their own star immediately and bring up their forces in a massed attack. He also gained the impression that this force was already in

space, cruising slowly in our direction ready to advance at the call of the scout.

This meant a very short interval of peace for the Solar System, as their ships were capable of extremely rapid travel. Neil put their maximum at something like 20,000 miles a second. If his impression as to their position at the time was correct then they could be brought up to the Solar System within a very few months.

This conference seems to have been extremely exhausting to both sides, for at its close, the Sirians requested a twenty-four hour interval for recuperation, an interval that suited Diane and Niel very well indeed.

This time, as they started to buckle on their helmets preparatory to going out into space, the Sirian commander called over a young officer and said, "I am sending this officer, whose name is Kan Atra, with you to see that you do not make any attempt to escape. I could, of course, ask your parole, but I am certain that you would not give it, so I am taking this precaution instead."

AS soon as they were back in their own ship, Diane turned to Neil and said, quietly, "It's our chance! Those men are intelligent, but they aren't quite clever enough. Fancy letting us get that thought that they needn't keep a watch on us, as we are too exhausted to try to escape.

"Did you get that too?" he asked, "I *thought* I did, but couldn't credit it. I guess they didn't realize that we got it as it wasn't sent to us."

"Yes, Neil, and do you realize that we can mask our thought from them and that they can only get our thoughts as far as we choose to let them?"

"Yes, dear," he agreed, "I discovered that, and have been wondering just how we can take advantage of it."

"Why, don't you see?" she persisted, "That Sirian officer can't get our thoughts, so we ought to be able to find some way to get rid of him so that we can try to escape."

"Hm-m," thought Neil, "Guess that's so. Well, much as I hate to do it, even to an enemy, since he seems a decent sort of chap, I guess I'll have to—— Get his attention for a minute can you, Di?"

"Oh, Neil, you don't have to——"

"No, dear, only just give him enough to put him to sleep while we tie him up."

When a few minutes later the Sirian woke up, he found himself securely bound and gagged. Seeing that he was awake, Neil went over to him and said, "Sorry we had to be so inhospitable, but you can see why."

"I understand," said back the officer, but could you allow me freedom to breathe in comfort?"

"Why, yes," consented Neil, knowing that Diane was thinking the same thing, "We'll give you complete freedom if you'll give us your word that you won't interfere with anything we do."

The prisoner hesitated. Sensing his thought, they assured him, "No, we are not planning any action to injure your people just now."

This satisfied him and he gave his word, which they felt quite safe in accepting, since they had realized that these people had a very definite code of honor of their own.

Having freed their jailor, they prepared a meal and when it was ready they invited him to join them.

His face lighted up with pleasure at this fair treatment, but he shook his head doubtfully.

"Your foods may not be suitable for me," was his expressed thought. Then with a sudden change of idea, he thought, "I believe I will try some."

He found our foods moderately to his taste, though there were a number of things that he refused after very careful

investigation. His attitude seemed to be that the chemistry of his body might be sufficiently different from that of ours to make the eating of certain foods dangerous to him. However, nothing that he did eat seemed to do him any harm, either then or at any other time.

WHEN they had finished and had had a couple of hours rest, they started to plan their escape.

Their ship was attached to their captor only by a slender cable, since both vessels were merely drifting without power. To unhitch this cable required only a few minutes work, although it meant going out into space to do it, and, in order to minimize the risk of detection, Neil had to work without his pocket projectors, pulling himself along the cable till he reached the couplings close to the enemy ship.

Carefully he unfastened this coupling, but left it holding so that a slight jar would separate the two vessels. Then, taking infinite care not to let go of the guiding wire for an instant, he slowly made his way back to his ship.

These were moments of intense anxiety to Diane. Neil was forced to work without light so that he should not be seen, and this meant that he was also invisible to her.

"Suppose he let's go of the cable and drifts away!" she thought, "He'll never get back, and I'll never, never find him again!"

With a half-sob she pulled herself together—forced herself to be busy. Neil would need a hot drink when he got back. At least she could have one ready.

After an interminable time Neil reappeared in the space-lock. He entered the ship, slipped open the face-plate of his helmet, and most thankfully drank his coffee.

"O. K. so far, dear lady," he reassured her, "But now comes the ticklish part. Somehow we've to start this crate away from the enemy without letting him see us go. That means we can't use our rockets—far too conspicuous."

"But how *can* we?" Diane looked puzzled, "When we planned to drift away I never thought about that. Shan't we rather tend to drift towards him?"

"It was a bit of a problem I must admit, and I'm not so very sure even yet that it will work. Just in case it doesn't, my dear, you'll have to do something very hard indeed. When I go outside to try my plan, I shall tie a light rope to my belt and take a flashlight with me. If I give three short flashes followed by two long ones it will mean that I've failed. Then you must start the rockets pointing towards the enemy and, using all the acceleration you dare, must drive the ship away from him."

"But, Neil," she stared at him horror-struck, "Oh! I couldn't possibly—and risk leaving you behind?"

"There's very little risk of that, little lady mine, I'll take a good, stout rope," he assured her.

"But, Neil," she persisted, "You may get caught in the *rocket blast!*"

"We must risk that. For the sake of our worlds we have to take that chance. One of us at least must escape.

"I don't think there's much risk, though," he added quietly. "I'm taking a couple of powerful pistols. If you have to use the rockets and tow me, I shall use the gun to drive me sideways out of the stream of fire. I think—I'm sure they're powerful enough."

A few more explanations, a long kiss, and out again into the void he went, knowing full well that, if his plan failed, his chances of life were very slim indeed.

At high velocities the factors of apparent increase of mass and of the slowing down of time have to be allowed for. A ship's chronometer and its other instruments will show variations from the Terrestrial standards if great velocities are used. The variation is, however, negligible unless a speed of more than two hundred miles a second is used.

Corrections are based on the simple formula.

$$T_m = T_s \frac{1}{\sqrt{\left(1 - \frac{v^2}{c^2}\right)}}$$

Where T_m is time registered by moving clock, T_s is time registered by stationary clock. v is velocity of object; s is velocity of light.

END OF PART ONE

To Our Readers:

IN our announcement in the August-September issue of *Amazing Stories* we promised this issue would be worth-while waiting for. And, we have done everything in our power to live up to our promise!

Most noticeable, of course, is the change of size. We have, at considerable expense, changed *Amazing Stories* to this new, convenient library size—with 50% more pages than the former *Amazing Stories*. And, we have obtained for our readers the cream of the present day science-fiction—the first group of these stories appear in the surrent issue.

Remember, although the physical dimensions of *Amazing Stories* have been changed, there will be no alteration in our editorial policy—the same number of stories as heretofore will appear in each issue and we shall endeavor to gradually increase the contents in coming issues. Only the best science-fiction stories will be used.

We sincerely hope that our readers will find the new *Amazing Stories* of greater value then ever before. You may rest assured that we will do everything in our power to make *Amazing Stories* bigger and better than ever!

The Editor

The Tree Terror

By DAVID H. KELLER, M.D.

The deforestation of the forests of North America sometimes seems to have assumed almost a tragical aspect. It is a hopeful sign that in giving employment to those who, in the words of Thomas Hood, ask as a favor what was given as a curse, the work takes the shape of reforestation. It may be the entering wedge to develop a scheme to cover the whole country. In view of all this, Dr. Keller's story will be found very "à propos." It is a Kelleresque flight of fancy.

Illustrated by MOREY

Foreword

ALL biological activities are governed by natural laws which are the end results of countless centuries of trial, success and failure, experimentation. Forms of life have developed in response to changed climate and environment, have reached an apparent perfection of adaptability and specialization, and, then, have died rapidly, because of an absolute inability to adapt their manner of living to new and unusual conditions.

But these changes have been slow in the time element and there have always been some life types that were able to survive, mainly due to their ability to change and to a sufficient number of generations for making the necessary alterations in structure.

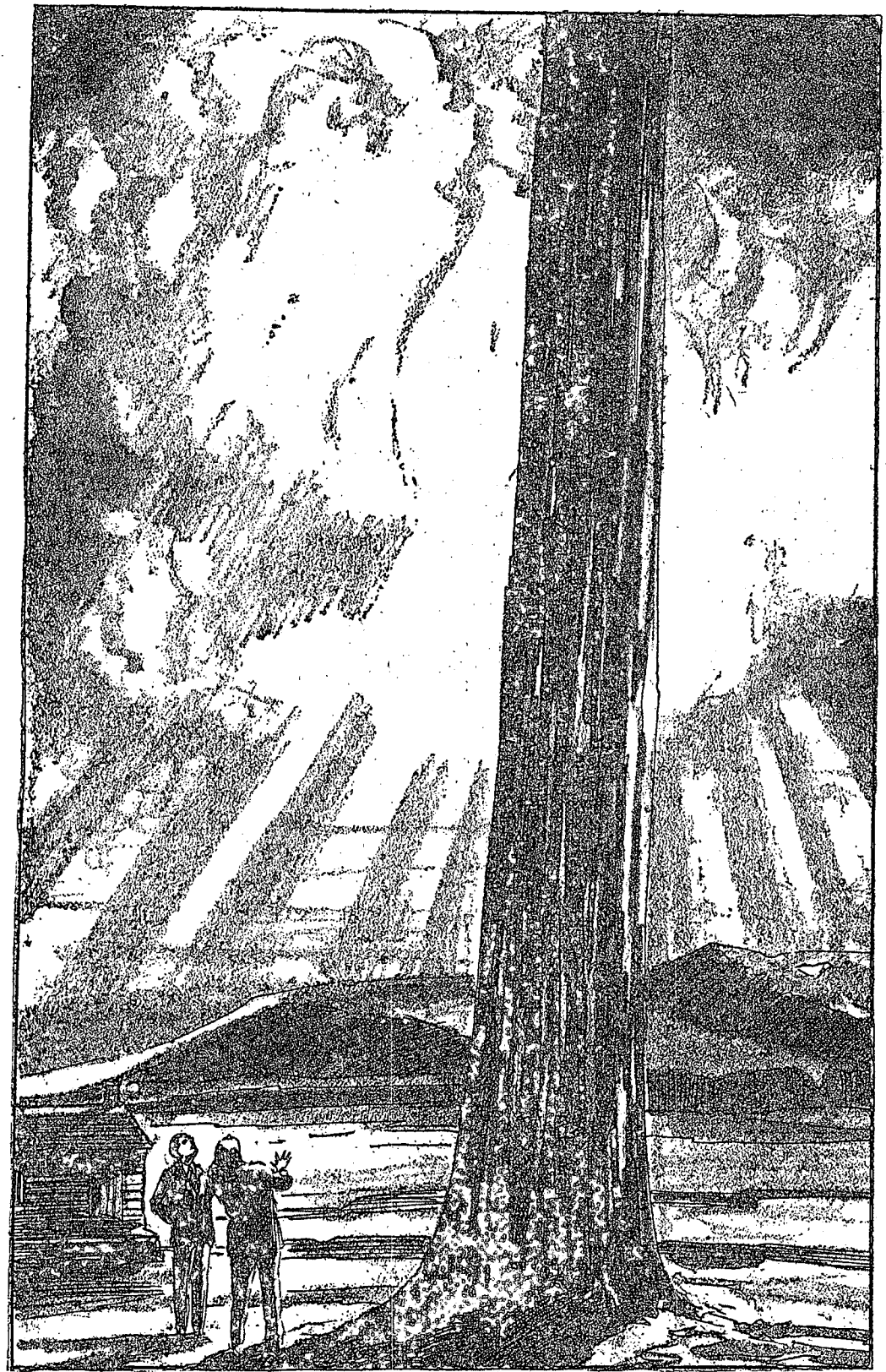
Two possibilities confront humanity of the present age.

Is it possible that science will develop some new force, hitherto unknown, which will accomplish in a generation changes that heretofore might have taken a million years? Granted that such a power would be unintentionally discovered and liberated, would mankind be able to adjust himself with sufficient rapidity to maintain his place of supremacy on this planet?

So far, man has developed upward. In spite of every climatic change, in spite of disease, in spite of famine and unnecessary wars, the human race has survived. He has lived on, because he has been adaptable. But in every instance the time element has been in his favor. Man was able to live through the rigors of the glacial period, but he had over nine hundred thousand years to become accustomed to the changes in temperature. What would have been the result if the glacial invasion had reached its height in ninety years?

The scientist, made grandiose by countless successes, is talking of harnessing the tides, of changing the Gulf Stream, and of completely changing types of life in one generation. What if he succeeds?

THE President of Cellulose Consolidated was worried. There had not been a period when the demand for cellulose had been as large as it was now. From a hundred different industries came orders of the greatest importance. The scientist of every nation was turning to plant life for the basic material necessary for the manufacturing of a thousand synthetic products. Pulp paper forests, corn stalks, sugar cane, cotton plants and even goldenrod and milkweed had been commercialized to the utmost, but, the demand for cellulose far exceeded the supply.



On the flat, treeless plain of the prairie the sixty-foot tree moss stood up like a flag pole. It was now over five feet in diameter, and daily observations showed that it was still growing rapidly.

"And it is not because there is not enough land!" thundered Timothy Tompkins to his Board of Specialists. "There are, in the United States, millions of acres of uncultivated land that could be bought for a song. Plants grow on land; all you have to do is to find the plant. Better get busy! If you men lack the necessary intelligence and imagination, I can easily replace you."

Simcox, one of the horticulturists, became indignant.

"You are wrong, Mr. Tompkins, and I am going to say so, even if you discharge me the next minute. The reason there are millions of uncultivated lands in the United States is simply the fact that nothing will grow there. The land is poor, and there is no water."

"No water?"

"Yes, lots of it, but it is thirty to a hundred feet below the surface. Any man can put down a pipe and pump it up, but it will evaporate before it spreads over five acres. You cannot put water on those deserts fast enough to do any good."

"How about the irrigation of the date palms in the Imperial Valley? Water does good there, does it not?"

"Yes; but there the water is piped to the roots of each individual tree. You cannot grow cellulose that way. It would be too slow, too expensive. I will tell you how to grow cellulose in the middle of the Sahara desert, but it will cost so much that you would not want a second ton produced."

"All you say is true, Simcox, and I am not going to argue with you. But I am going to tell you, and all of the rest of this high salaried Board, one thing. I must have more cellulose, lots more, and it has to be produced at a low price per ton and near enough to our factories so that the freight will not be an expensive item. Now, go ahead with the problem. If you fail, you're fired. That statement goes better than a hundred arguments. I am not a scientist, just a business man. I hire intelligence. When I do not get my money's worth, it is just too bad for the experts. My advice to you is to get busy or get out!"

That ended the argument.

Simcox, doing all he could, could see no solution. He talked plants, thought plants, even dreamed of plants. One dream was especially terrible. He fancied a world of plants, growing rapidly, fighting each other for root room, stretching upward towards the sun through dismal dank forests, reaching an early maturity and rotting, only to furnish food for their children and grandchildren. He dreamed of a world so overgrown with vegetation that few other forms of life could exist, a world where every drop of moisture was sucked out of the ground, carried up the trunks of trees, dissipated into the air to be returned in a perpetual rain. He awoke in a shivering sweat.

"That dream is a memory!" he whispered to himself as he shaved. "Such a world existed at some time. I must find out more about it."

He told the dream to a friend who happened to be a palæo-botanist. The man laughed at the dream and inquiry.

"I AM surprised at your question, Simcox. Of course you are not as well acquainted with the past plant life as you are with the present. Your dream is a rather vivid description of the earth during the Carboniferous Age of the late Palaeozoic Period. The earth was a swamp; the climate was hot, almost steamy, and rain fell most of the time. Tree ferns, club mosses, and trees that later became conifers grew in lush profusion. The scale tree, *Lepidodendrom*, the seal tree, *Sigillaria*, club mosses a hundred feet high and *Cordaites* fought each other for the right to live, for water

to drink, and for a place in the sun. There were a few insects, some amphibia and occasionally a primitive reptile. You read the description in a book, forgot it, and then recalled it in a dream. All very simple."

"But what became of them? What was the end of such giant vegetation? Ferns a hundred feet high? Moss as tall or taller?"

Again the specialist laughed.

"They fell to the ground and changed into coal. I can show you hundreds of their pictures in the rocks of the coal beds, fossils of their trunks, their leaves and even their spores. We have ferns and moss now, but all those giant forms are gone—forever."

"What a world that would have been for the Boss!" exclaimed Simcox. "It would have given him all the cellulose he could have used. Of course, we know about mosses and ferns to-day, but our plant would use a year's supply of such little things in one day. It would just be aggravating. If we cannot grow enough corn stalks in a season to satisfy his demands, why think of mosses and ferns?"

"Of course," reiterated the palaeobotanist, "those plants were very large. The club moss grew over six feet in diameter, and fully a hundred feet high. Their roots were driven into the earth to a distance of sixty feet. And it is supposed that their growth was rapid. A scale tree, a thirty meter fern, grew to maturity in a single season and died as quickly."

"ARE you sure of that?" asked Simcox.

"I think so. Of course, the only way we know about it is to compare the vegetation of that period with its descendants of our own period. That is what I used as a basis for my statement."

"There is help there for me. At least, there is a line of investigation," sighed Simcox. "It may help me to hold my job and then again it may make the Boss think I am insane. At any rate, I am going to study the ferns and mosses. If a variety could be developed that would grow six feet in diameter and a hundred feet high in one season, it would give Cellulose Incorporated all the raw material it needed."

He started to study the lycopods. Nothing very startling there. Little flowerless herbs, with erect widely branched stems and small simple leaves, closely covering stems and branches. The fertile leaves were arranged in cones, holding spore cases in their axils. Rarely more than six inches high. The spores, falling to the ground, formed prothalium, and these, breaking up into male and female parts, caused the generation of new plants. All very simple. Nothing there he did not already know. But there was a difference between a club moss six inches high and one a hundred feet high. The difference was exactly ninety-nine and one-half feet.

No help in the club mosses to make his job a permanent one. He felt that the secret was there, but that was all. The very fact, that he felt the way he did, made him more determined than ever to learn what the secret was. He practically lived and slept with the mosses. He talked to everyone who knew anything about their mode of life and reproduction. After a few weeks of this, people began to talk about him and shook their heads in a significant manner. A good fellow gone wrong. But at last he found something. At one of the Eastern colleges a scientist was studying the effect of X-ray bombardment on the spores of ferns. Doses of 2,500 to 5,000 roentgens increased the rate and quality of growth. Doses of 7,000 to 30,000 stopped growth but did

not kill. Instead it made an occasional spore into a giant, several hundred times the average size. These gargantuan spores remained alive but did not grow.

Simcox went there. The college scientist welcomed him and told him all he knew. He opened a small pill box and showed him some of the massive spores, really little balls, but in comparison with other spores of the same plant, enormous seeds.

"Have you done anything like that with the club mosses?" asked Simcox.

"No. Only with ferns. But the same thing would happen. At least, I think so."

SIMCOX left at once. He had an idea and was afraid of talking. Strange as it might seem, he went at once to see Timothy Tompkins. He told him the story of the giant club mosses of millions of years before and the tale of the spores, made two hundred times larger than their brother spores by the action of the X-ray bombardment. Tompkins was interested.

"If you can grow me millions of club mosses each six feet in diameter and a hundred feet high, your job is saved and your salary increased ten times; how long will it take to grow just one for me?"

"It may take a year; it may take a lifetime. I told you that the college man was unable to make one of the large spores grow, didn't I?"

"I am not interested in failure," growled the President of Cellulose Consolidated. "Effort without success simply irritates me. You can have unlimited funds, and a year of time. By the end of twelve months you either will or will not make good. You can draw on me for any sum you want. If you fail, I never want to see you again. If you succeed in finding a new and unlimited source of cellulose, you will be one of the big men in our company. Now, get out of the office! I have other things to do."

With unlimited funds at his disposal for experimental purposes, Simcox lost no time. Hundreds of plants of club-moss were irradiated. Their spore formation was studied. There was no doubt about the fact that large dosage of X-raying produced the massive type of spore which seemed capable of living indefinitely but showed no inclination to grow into new plants. There was the difficulty! How could it be shown that a larger spore produced a larger form of club moss if the spore did not grow?

Metchlinkoff, working on frog's eggs in Chicago, gave Simcox the hint. Irritation of the spore with a fine needle. That stimulated the frog egg; why not the spore of the club moss? Simcox tried it and found that it worked. Once the spore was irritated and buried in rich soil, it started to grow. The growth of the first six spores was so startling, so rapid, that Simcox closed his laboratory to all visitors, had most of his assistants transferred, and deliberately destroyed the young plants.

HE transferred his laboratory to an isolated part of Nebraska. There he had leased a two thousand acre tract. The land was rich, there was some water, the roads were poor, and there were no tourists. He re-established his laboratory, and a hundred feet from the house he planted one of the massive spores.

All he had to do was to wait. It was summer time and hot. In a week the shoot of the club moss was out of the ground. Simcox ran a water line out to the young plant and gave it water daily. At the end of the second week it was twenty feet high, one foot in diameter and gave the impression that it was far from maturity. The scientist

waited one more week and then sent a wire to the President of Cellulose Consolidated, asking him to come out to Nebraska. The message was short but distinctly urgent. Timothy Tompkins evidently realized that Simcox had something to show him. He went to Nebraska by plane. He arrived four weeks to the day after the planting of the spore.

On the flat treeless plain of the prairie the sixty-foot tree moss stood up like a flag pole. It was now over five feet in diameter, and daily observations showed that it was still growing rapidly. Simcox took the President of his company out to the moss without a word of explanation, without even a word of welcome. He wanted Tompkins to make his own observations free from interruption from a subordinate.

Tompkins looked at the tree, felt it, took a penknife and cut into the bark. He took out a pocket magnifying glass and looked at the piece of wood in his hand. At last he turned around to his employee.

"How old is the thing, Simcox?"

"I planted the spore twenty-eight days ago."

"Have you any more of the seeds?"

"Sure! I think that I can produce them by the thousands."

"Then, what are you wasting time for? Get busy! I'll send you a hundred men. Plant ten thousands seeds, fifty feet apart, and we will see what will happen. Three months from now we ought to have a forest. Will they have seeds? Do you suppose we have a new kind of plant? If so, we will not cut a single one of them, but I will lease every piece of land for fifty miles in all directions."

"But are we sure of our finding, Mr. Tompkins? Here is one freak vegetation. How do we know that other spores will grow in the same way? How do we know that the spore from this giant club moss will reproduce similar trees? Would it not be best to go slowly?"

"No!" thundered the President of Cellulose Consolidated. "We cannot lose a day. I have twice as many orders as we can possibly fill. If this thing is as good as it looks, it is worth the gamble. I am going to lease every inch of land I can, and you stay here and get every seed you can ready for planting. I will have a planting crew here that will do anything you tell them to."

"But how about water?"

"I'll run a pipe line from the Great Lakes if necessary. You annoy me with your timidity. Let's get this thing started."

THREE months from that time a forest of club moss trees was growing in western Nebraska. It was soon found that it was unnecessary to water them. They seemed to get all the moisture necessary from the soil and air. The first tree was now maturing and forming spores. To Simcox' delight and astonishment, these spores were as large as the ones he had first planted. Evidently the trees were able to reproduce spores as large as those activated by the X-ray. And when these were planted, their rate of observed growth exceeded, if anything, the daily growth of the present trees. The spores were carefully gathered and planted. A few of the first trees were cut down and their pulp studied for experimental purposes, but most of the old trees were allowed to stand.

At the end of a year the ranch house was in the midst of a dense forest that extended from it for twenty-five miles in all directions. All of the leased land had young trees planted on it, either by hand or by the wind. What had once been open treeless prairie was now a dense forest. Even the roads were overgrown and it was increasingly difficult

to drive a machine into the center of the growth. Men had been lost in the forest. The constant falling of old trees added to the danger.

If at that time the full import of the novelty had been recognized and corrective measures taken at once, the future terror might have been avoided. But the President of Cellulose Consolidated, not wanting to waste a single year, started similar forests in Kansas, Colorado, Arkansas and the waste lands of Louisiana. It is true that he started lumber camps on the edge of the Nebraska forest, and, for a time, was able to harvest the giant club moss trees as fast as they grew, but, even with the resources at his command, even that first forest outgrew the efforts made to convert it into commercial cellulose.

Two other factors operated unfavorably.

The spores were windblown for hundreds of miles. Where one fell it grew. Where one grew one month a thousand grew three months later. New forests developed seemingly over night. Nurseries, feeling a sure demand for the agricultural novelty, sold seeds by the hundred thousand. Landowners were advised to grow their own forests for fire wood and wind brakes. Everybody wanted to have at least one club moss tree, even if there was no other place to grow it than in the front yard.

Cut into firewood, it burned with a peculiar blaze and an unusual warmth. One tree would furnish winter firewood for a family. Its growth was recommended by charitable associations and fought by the coal miners. If cut down during the first month of growth and cut up, it was readily eaten by cattle. It was new, useful and spectacular.

Not till the third year was the danger realized.

Then it was too late.

THE production of club moss trees had passed out of human control. Their growth crowded out all other vegetation. Their falling trunks began to block the highways, arteries of commerce. Only by constant vigilance were the railroads kept open and safe. The land that formerly grew food for a nation now grew nothing but cellulose. The deserts changed into forests, for the tall club moss had roots that had no difficulty in driving down through the dry sands and reaching the water thirty feet below the surface. The smaller rivers were drained of their water, the large rivers became slow flowing swamps. The cities remained isolated oases, saved by their cement pavements.

The mountains might have saved the Pacific and the Atlantic coastal regions had the danger been realized early enough, and had there been no wind. But where water flowed and wind "blowed" the spores carried their menace.

And with the forests came rain. Not gentle, pleasing showers, alternating with days of sunshine and happiness, but a continual dripping precipitation that aided in the rotting of the falling trees and the more rapid growth of the new vegetation.

For decades man had become urbanized. He had almost forgotten the necessity of the agricultural regions. Milk, meat, vegetables, grain came from farms seldom seen and never appreciated, and all that was necessary to prolong life was the cash to buy the products of the farm brought to the cities by train and truck. Now, acre after acre, farm after farm was abandoned to the silent enemy. Where little families had lived, happy, with their feet on the soil and their heads in the clouds, giant trees shot upward, making all other form of life, vegetable or animal, an impossibility.

The cities were starving. Not only that, but they were increasing in popula-

tion at such a rapid rate that there was no work, no room, and no hope. Armies were mobilized to clear land, but faster than the trees could be destroyed they reproduced. People sickened as they worked, despaired as they labored in the constant rain and unending growth and rotting. The United States was rapidly returning to the Pennsylvania period of the Carboniferous age.

CELLULOSE CONSOLIDATED had apparently caused the downfall of a nation. In an effort to secure more business it had been too successful in the growth of cellulose. There was more of the important raw product now in the United States than a dozen nations could commercialize. Besides, people were not buying these products now. All they wanted was food. Clothing, newspapers, a hundred former necessities now seemed useless luxuries. When a man is hungry he can think of nothing else.

Simcox, haggard, remorseful, thinking of little except the starving millions, walked, practically unannounced, into the once busy office of Timothy Tompkins, the President of Cellulose Consolidated. The erstwhile great man was mixing a can of condensed milk with twice its volume of water and drinking it between puffs of a cigar. He was not very happy. At any time the national consciousness might awaken to the fact that he was responsible for the Country's calamity, and then the mob would demand his life; and death at the hands of a hungry mob was not a pleasant thing.

He looked at Simcox with the anger of a God gone mad.

"Get out of here!" he yelled. "I do not see how you have the courage ever to face me!"

Simcox was not afraid.

The peril of the tree terror had been a great leveler of caste. A rich hungry man was just about equal to a poor hungry man in those days. He sat down opposite Tompkins, without invitation took one of the Havanas out of the humidor and began.

"No use being sore, Mr. Tompkins. You engaged me to do a certain piece of work and told me I would be without a job if I failed to make good. You wanted more cellulose. Was it my fault that I produced more than you could use?

"You told me that the life of the nation depended on the supply of cellulose. When you talked to us that day you told of a hundred necessary products that could be made from cellulose and of a hundred more household necessities that might come in the future if the supply of raw material placed the cost of production low enough. Do you remember? How you told of the day when houses, roads, even railroads would be built of celluose? You threatened me and I reacted to the fear of losing my job by giving you the raw material.

"And what did you and your great company do? Practically quit! Because you could not sell, you ceased to invent new uses for this cellulose and even stopped to supply the world with the stuff you knew how to make.

"You quit! At one time you said that given enough cellulose you would give man a three-day, three-hour working week and let him play the rest of the time. I gave you the raw material, and you let America starve to death.

"But I am here to save the nation if you have the courage to fight."

Tompkins almost swallowed his cigar in his rage.

"There was a time," he yelled, "when I would have picked you to pieces and filled the scrap basket. Now, I am through."

"I thought so," said Simcox, "but you were a man once and there may

still be a backbone under that yellow streak. Let me tell you something. In the outer office I have a new found inventor. He is so much of an insane genius that he can think and talk of nothing except cellulose and things to do with it. He has a little machine. A man can cut pieces of club moss with a penknife, feed it into that machine and turn a crank, like a coffee grinder used to have, or an ice cream churn. And out of the other end comes food. Real food. I have tasted it. The fool inventor has lived on it and water for three months and is as fat as a turkey at Thanksgiving time. Food! Think of it! You used to say that a steer could take cellulose, digest it and turn it into meat and fat. I remember reading a book about the termites, and how they lived on cellulose. Now, this inventor has turned the trick. Lord Birkenhead prophecied it for 2030, but you said it was too expensive. But the man tells me his little machine can be made for less than three dollars, and five cents' worth of chemicals will make enough food to keep a family a month.

"Use the resources of your great concern. Put these idle million of city dwellers to work. Pay them with machines and a quart of the necessary compound. Send them to the rims of the forests and tell them to break up the young plants and feed them to the machine. Put hope into their hearts. Send word over the nations that from now on no one will go hungry! Radio the specifications of this machine to each of your factories. Tell every manufacturing concern, automobile plant, furniture factory how to make them. Broadcast it! Put food into the stomach and hope into the soul of the desperate men of the nation! Get busy! This inventor says you can have the machine. He is so busy working on new ideas that he cannot be bothered. He thinks he can make other machines, little household equipment, run by hand, that will make the lives of people comfortable by new uses of cellulose.

"There is room in the cities for everybody. What has made them desperate has been the lack of food, the daily deaths from starvation. With a development of courage and a national spirit of victory, the tide may yet turn. The forests may fill the farms, but even fern trees cannot live on cement pavements. And that cellulose, you wanted so much and did not know what to do with when you got it, can be made to feed us, clothe us, supply us fuel, houses, roads. Once you were called the greatest of all industrial Americans. Here is your chance to show that you deserved that reputation. What is your answer?"

TOMPKINS stood up by his desk. He had been a great leader, and he was still a great one.

"Bring that man in," he cried.

Soon an odd shaped box was on his office table. A long haired man was caressing it lovingly, as a father would an only child, and telling in six syllable words just how it worked.

Tompkins took a dozen lead pencils and broke them to splinters.

"Cellulose is cellulose!" he cried. "This is cedar wood, but the principle remains the same. Which way do you turn the crank?"

Five minutes later little brown tablets began to drop out of a hole near the bottom of the machine. Tompkins put one in his mouth and started to chew.

"It's good!" he cried. "It has a lead-pencil taste, but that can be remedied, and, anyhow, club moss would be different. I do not know so very much about machinery, but if this man made this one, he can tell my experts how to make more." He pushed a dozen buttons and

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Into the Hydrosphere

By NEIL R. JONES

This is another of the Jameson series; in it we are introduced to a strange conception of a world, something hitherto undescribed by any or possibly by very few. Our etymologically disposed readers may be referred to the title, which we think will tell them just enough to start them to surmising what this story may be about, for it is a very novel conception and different from anything which we have given in the past, if we take it in its entirety.

Illustrated by MOREY

Introduction

LONG before he knew he was to die, Professor Jameson, a scholar of meteorology and an experimenter in rockets, built himself a funeral rocket. His belief sustained the theory that organic material isolated in the vacuum of space between worlds remains unchangeable. In accordance with the terms of his will, his nephew secretly followed the professor's instructions. As the professor had foreseen, his rocket became a satellite of the earth.

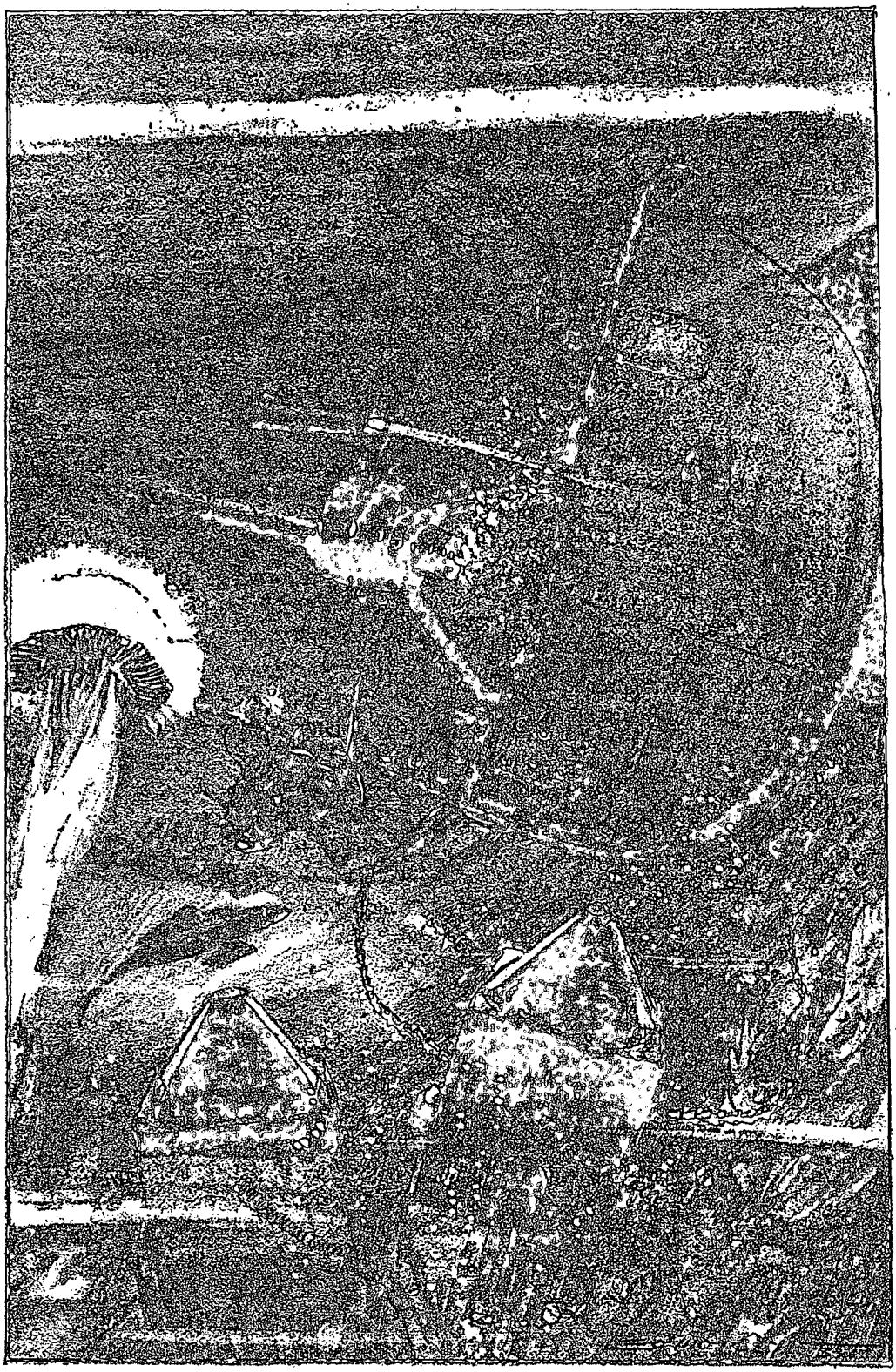
Forty million years after, life having disappeared from the earth's surface, an interstellar ship from Zor, a far off world of the universe, blundered upon Professor Jameson's cosmic mausoleum. Inspection by the inquisitive machine men of Zor revealed to them the professor's body, perfectly preserved, even as on the day of his death.

The machine men from Zor are creatures who attained immortality ages ago through transportation of their brains from flesh and blood bodies to the conical heads of metal. All of metal, their bodies are cubed, upheld by four jointed legs, the upper appendages consisting of metal tentacles. Surmounting the cubed bodies are the metal brain cases, possessing a complete circle of shuttered eyes. In addition, an eye is conveniently placed in the apex of the head to allow a vertical view. Mental telepathy is their mode of communication.

The professor's brain was removed from his corpse and stimulated into activity once more, being placed in one of the machines. In this manner, Professor Jameson awoke from his death of forty million years to discover himself a machine man. With the Zoromes, he embarked upon a life of perpetual adventure and exploration among the countless stars and their myriads of planets.

The devious route of these cosmic wanderers brought them to the planet of the double sun where weird, winged phantoms from another dimension wiped out many of the machine men, bringing destruction to the metal heads, the only death blow to a Zorome. With the help of a race of Tripeds from a neighboring planet, Professor Jameson waged war on the winged demons, entering their own dimension to destroy them. Many of the lost machine men were rescued from a living death, and plans were made to leave the planet of the double sun.

While the space ship was being repaired, several of the Tripeds signified their desire to become machine men. The brains of Glrg, Ravlt, Brlx and Jbf were removed from their bodies and placed in



They watched with rising interest the vessel's slow movement towards the farther wall. The wall sank slowly inward and the submarine entered.

four metal heads of the mechanical bodies. In this manner, the ranks of the Zoromes were augmented to twenty. Manned by the twenty machine men, the space ship left the solar system of the double sun, speeding rapidly toward the distant stars and new adventures.

CHAPTER I

LIKE a ghost of the cosmos, the space ship of the Zoromes flitted silently into the rapid growing sunlight of a star. To one side lay the crescent of a large planet, rough, jagged mountain peaks presenting a serrated embroidery for the surrounding twinkle of the far-off stars. Ahead, in the path of the space ship, yet farther distant than the planet they were passing, a smaller world gleamed like a bright jewel, shedding a dazzling lustre incomparable. Its brilliance was quite in contrast to the dull crescent of the outer planet.

From afar, the greater brilliance of the small world had aroused the curiosity of the twenty machine men. Always on the outlook for the unusual, and more than willing to digress from the general route they were pursuing in the direction of distant Zor, the travelers sped on toward the bright comet.

"Why do you suppose it gleams so brightly?" queried 88ZQ4, who among the Tripeds had been known as Brlx.

Professor Jameson regarded the planet they were approaching rather critically. Then he gave reply.

"It may possibly be the quality of the atmosphere. Then again, the surface of the planet may be an endless sea, at least on the hemisphere facing us. The latter supposition seems more probable."

6W-438 left his place at the telescope. "It is no use trying to see anything there until we are in a position where the sun will be directly behind us."

Grouped about the professor stood his metal companions, nineteen in number, all tried and true. Four of them, 88ZQ4, 92ZQ153, 5ZQ35 and 45ZQ42 were as yet a bit unexperienced, being the recent converts from the planet of the double sun, yet they had proved themselves on several planets since leaving their own world. Brlx, Ravlt, Glrg and Jbf were no longer known by their unclassified names but, like Professor Jameson, 21MM392, possessed numeric classification in the exacting category of the Zoromes.

The remaining fifteen machine men were from the original stock who had found the professor's rocket satellite in the shadow of the dying world. These fifteen were fortunate to have escaped the deaths meted out to their companions in the solar system of the Tripeds.

Their attention was now centered upon the bright planet ahead of them. Little observation was accorded the large world they were passing. Telescopic observation had revealed a rough, sterile surface of upflung mountains, rare atmosphere, and meteoric craters. The world beyond interested them more.

Had they observed the larger world more closely, they might have seen dark, lurking shapes which hung upon their path, approaching them cautiously from behind. Several of them crept closer to flank the craft of the Zoromes. The first intimations the machine men had of the mysterious followers was a sickening jar which ran through the ship.

Instantly, all was pandemonium, yet from all the immediate confusion there resolved a definite order as machine men ran helter skelter to their various positions.

"A meteor," exclaimed 38RU-497, "Our repulsion rays have become imperfect!"

"Meteor nothin!" was 29G-75's start-

ling announcement. "Space ships—out there!"

He waved a tentacle towards several dark shapes which hung close to them on three sides. The grim, silent followers were visible where the sunlight from the nearby star struck against their sides. While the machine men watched, an irridescent flash spouted menacingly from one of the dark ships. Again came the jarring crash as the space ship of Zor listed to one side.

"They're attacking!" exclaimed Professor Jameson. "Man the destroyers!"

With alacrity, several of the machine men leaped to the weapons of offense. A glare of light stabbed the vacuum, flashing against the nearest ship from which had come the power beam. For a split second, the intense light supplanted the position of the lurking craft. When it disappeared, the space ship was gone. 56F-450 trained his piece on another of the mysterious ships. With its companions, the shadowy craft turned tail and fled, but not before the machine man's ray split the darkness once more. The second ship suffered the fate of the first. The others retreated from sight, proving the adage of discretion *versus* valor.

"What were they?"

"And from where did they come?"

These were the questions the machine men flung at one another, yet there were none among them who really knew. 41C-98 ventured the obvious solution.

"They probably came from that world." He designated the mountainous surface of the crescent which stood out so sharply against the star sprinkled background.

"We can investigate later," said 44U-21. "Right now, the little world is more important."

"But what if they attack us again?" asked 5ZQ35.

"They won't," 56F-540 replied. "Not after the way I blew those two ships of theirs into nothingness. We proved rather conclusively that we are their masters in regard to weapons."

The ships of the machine men sped on in the direction of their main objective. By approaching the little world at right angles to their previous course, they were enabled to view it to better advantage. During the maneuvering, a sharp watch was kept for the ships which had displayed their animosity so recently, but nothing more was seen of them.

6W-438 at his position near one of the farther range telescopes of the ship did state, however, that he was pretty sure he had seen several small dots descend into the far-off mountain passes of the larger world. This rather corroborated the assertion of 41C-98.

"We'll go back that way after we explore this other planet," said the professor.

Little did they realize the startling events to befall them ere they reached the larger world, nor did they reckon on the time to be spent on the smaller world which now grew larger before them.

THOUGHTS of the fight in space were speedily forgotten for the time being, as the machine man at the telescope made a surprising announcement.

"Why, I can see no land at all! Only water, water and more water! It seems but a vista of endless ocean!"

"You're looking at only half the globe, remember," 744U-21 reminded him. "There may be land on the opposite hemisphere."

"Perhaps," was 6W-438's partial admission, "but the globe is rotating rather slowly, and no land has turned into sight yet."

And as the ship of Zor raced closer the bright sphere at a greatly reduced speed, the expressed doubt of 6W-438 appeared to be borne out. The planet made a complete rotation, yet no land was visible anywheres. Only an unending expanse

of water circled the equator, and this was continuous from pole to pole. Measurements were carefully taken and recorded. The diameter was estimated to be three thousand miles. The gravitational attraction and density were about to be computed when the machine men hit a snag. The difficulty led to an amazing discovery.

"To find the mass attraction, we must find the dimensions of the lithosphere, the land surface beneath the ocean," stated 744U-21, "or at least gain a workable average of the ocean's depth."

A specialised telescope used to probe ocean depths at a great distance from any planet was trained upon the watery world. A halt was ordered, and the space ship came to rest, hanging free in space. At this required distance, only topographical features were distinguishable. All details were lost."

"That ocean is deep," marvelled 20R-654, turning the wheel of the telescope slowly to gain deeper penetration.

He adjusted the instrument to detect solidity at a great depth. Only unfathomable water lay below them. At five hundred miles depth the search for solid land still mocked the efforts of the Zoromes. At seven hundred miles deep, the maximum properties of the telescope were reached. The machine men could penetrate no farther. In turn, each of the machine men took a look into the immense depth of water.

21MM392, it is my opinion that there is no land at all below that ocean," was 744U-21's opinion. "If it has no bottom at all, then the water extends unbroken clear through to the other side of the planet."

"You mean that it is a perfect hydrosphere?"

"Yes, a ball of water. An undersea ship might follow the diameter of the planet with unerring accuracy."

"We possess no certainty that the hydrosphere is a perfect one, however," said the professor, "but we can find out."

The planet of water grew on their vision at the machine men edged their space ship nearer. Upon the ocean, bright, yellow spots soon became visible. The machine men regarded them critically through the great telescopes. The spots were scattered far and wide, the closest ones more than a hundred miles apart.

"What are they?" Professor Jameson asked.

"It it hard to tell," replied 6W438, "until we obtain better vision. The sun is so bright on the water around them that——"

The machine man's mental utterance was cut short by a discovery of 744Z-21. The latter had been closely examining one of the yellow patches as it neared the horizon away from the direct glare of the sun.

"A city!"

The announcement was electrifying. Evidently, some form of intelligence resided on the watery world.

"But there is no land on which to build," 5ZQ35 expostulated.

"Nevertheless," 744U-21 reiterated, "I can see a city."

"Then every one of those yellow spots must be a city."

The machine men of Zor were anxious to learn more of the strange world. Once more the space ship was set into motion. Professor Jameson now assumed a position at one of the telescopes, gazing down at one of the yellow spots they were approaching, which 744U-21 had said were cities. The glare of reflected sunlight on the water was indeed troublesome, but with the aid of a colored lens slid into place the professor was able to view the details of the yellow city.

THE city, surrounded entirely by water, he estimated to be probably a

mile or more across. It consisted of a thousand or more buildings, low to the "ground." The highest building did not exceed forty feet, the architecture being of rambling and haphazard design. Most of the structures were either dome shaped or else roughly square. Many of them, however, rose to pyramids of unequal sides, while others were rectangular. Professor Jameson saw the inhabitants moving about along the avenues separating the buildings, but from his vertical view he found it difficult to make them out clearly, seeing only the tops of their heads. Increased speed of the ship also made vision difficult. Gravity of the planet was commencing to evidence itself, and this made the flight of the ship a bit erratic rather than smooth.

The space ship landed on the water not far from one of the yellow cities. Instantly several boats shot towards the cosmic traveler. The professor marvelled at the skill and speed with which the skiffs were handled. At a distance of several hundred feet, the boats stood off from the floating space-ship, waiting.

Several of the creatures stood up while the others sat in the boat wielding oddly designed paddles. The machine men obtained their first good look at the residents of the yellow city. They were between five and six feet in height and wore no clothing over their green, mottled bodies. The professor's first impression was of frogs, walking straight and erect. Bearing out this resemblance still further were the webbed digits which terminated both upper and lower appendages. The heads of these four-limbed creatures destroyed the illusion. They were quite round and would have been nearly spherical if the faces had not been flat. Sunken eyes gave the creatures a pathetic appearance, while an angular snout and a circular, gaping mouth completed the physiognomy. If they possessed ears, these organs were internal rather than external, the professor surmised to himself.

They were debating with one another excitedly, their boats clustered closer. Their voices, like the garrulous chattering of wild parrots, came clearly across the water. Finally, one of the boats drew away from the rest and came near to the space-ship. 88ZQ4 poked his head out of the space-ship. Instantly, several lances were hurled at him by those in the nearest boat. A concerted wailing arose from the other boats, as if in protest against this act of hostility.

Most of the lances glanced harmlessly off the side of the space ship. Two of them, however, struck 88ZQ4 quite squarely but with the same result of the other lances. They glanced off the metal man without leaving so much as a scratch. Swiftly, the attacking boat shot away toward the city. The other skiffs approached slowly. In the demeanor of the latter boatmen, Professor Jameson saw no warlike signs. They came rather fearfully. As they coasted alongside the ship, he saw in their minds a supplication of mercy. A weird, incomprehensible chatter arose from their throats, and the professor saw plainly that they were asking a forgiveness of the rash act of their brother.

The contrasted actions of the strange creatures puzzled the professor greatly. The first boatmen had displayed a desperate sort of defiance. In the minds of these others, the machine man discerned subjection to a nameless terror. Behind that terror lurked hate. That, the professor saw plainly. Here was a mystery which required solution.

THE professor climbed out the entrance of the ship which 88ZQ4 had thrown open just before the futile attack had come. Followed by several more of the machine men, he climbed out upon the hull of the space ship. The entreating chatter of the boatmen ceased. They

were evidently struck dumb in surprise. But, unfortunately for several of their number standing up in the boats, they were not stricken with inaction by the strange sight the machine men presented. Several of them bent to their oars in sudden alarm. This act produced a comical effect. Those standing were taken off guard by the sudden paddle thrusts and sent sprawling into the water.

The victims of the ducking showed remarkable agility in the water and appeared to handle themselves in this element equally as easily as on kelp land. They were back in the skiffs in the twinkling of an eye, continuing their surprised gaping at the Zoromes. Recovering their voices, they broke into a jabbering din. The paddlers kept the boats at a respectful distance, ready to shoot away towards the nearby city at the first alarm. The machine men waited for them to return to the edge of the space ship, but they showed no signs of returning.

It was in the power of the Zoromes to implant thought impressions on the minds of any intelligent creatures equally as easy as it was for them to divine the thoughts of others by mind reading. Professor Jameson now sought to allay the fears of the hydrosphere inhabitants and gain communcation with them.

"We shall not harm you," he radiated. "We are friends."

The jabbering ceased. The boatmen looked at each other wonderingly. Again the professor sent out his mental call. The creatures muttered among themselves and stared at the Zoromes, mystified yet trustingly. Timidly, they came up closer. Their leader chattered interrogations. From the other's mind, the machine men caught ragged pieces of what he was saying.

"We do not know your language," was the professor's reply. "Think well what you would say, and we can understand you even as you have understood us."

"Who are you?" asked one of the boatmen.

"Adventurers of the cosmos," was the machine man's reply. "We come from a world far out in the universe, countless light years distant from your system of worlds."

Most of this was lost among the green mottled creatures, the professor readily saw. Their intelligence was not sufficiently developed for them to conceive of worlds other than their own. In this, they were not far removed from many people the professor had known during his earthly life forty million years ago. These denizens of the hydrosphere did realize, however, that the machine men were strangers they had never seen before.

"Why did you attack us?" 88ZQ4 queried.

"It was Ogweg who led the attack," spoke the leader, giving voice momentarily to the name of his companion. "He thought you were enemies from the depths." The boatman pointed down into the ocean."

"And who did you think we were?" the professor asked. "Why did you not join Ogweg in the attack?"

"Because I knew it to be hopeless. Such attacks have brought down upon us only more oppression. We are powerless in the hands of the Uchke."

"Who are the Uchke?"

"Our oppressors — Our conquerors. Every one of our floating cities feels their iron hand. As far back as our ancestors can remember, it has been so."

"Why don't you fight them?" 744U-21 demanded.

"AS I have said before," stated the leader of the boatmen, whose name the machine men later learned was Chopoc, "we are powerless in their hands. They live where we cannot reach them, far below us, and they possess ter-

rible powers to destroy. From time to time, they come up through the water in ships not unlike yours to take slaves. No slave has ever returned to tell what happened to him."

The machine men maneuvered their space ship into the city of the Plekne, as the creatures called themselves. Here, the machine men made many amazing discoveries. The first thing to startle them was its uniqueness—was the city itself. It was a floating mass of kelp, heavy seaweed, a veritable Sargasso. The kelp grew far above the water and was woody in texture. The houses were built of the tough weed, the growing strands having been artfully interlaced and woven to make the various walls, partitions and ceilings. All the streets were made of the twined weed which grew to a certain length and then hardened above water level.

The Plekne, Professor Jameson learned, also used the tender young sprouts as edible, the rest of their fare consisting of fish and other sea foods. From time to time, the Zoromes perceived strange, swimming creatures that resembled the Plekne. Their upper appendages were like those of the Pelkne, with the exceptions of the long, wavy fins which ran their length. In place of lower limbs, however, they possessed tails like a fish. These marine counterparts of the Plekne, who breathed through their skins, seemed to stay in the vicinity of the kelp city, often surprising the machine men by wriggling their way up through the kelp and into one of the municipal pools where the sea weed had been cut away.

Chopoc explained to the professor that these mermen were the Nacac, a species closely related to the Plekne. It was a common belief, Chopoc stated, that the Plekne had descended from this race of water dwellers, having evolutionized through succeeding aquatic and amphibious stages before becoming surface dwellers. Professor Jameson was rather inclined to accept the theory himself, especially in view of the Plekne's webbed hands and feet, their agility in the water and Chopoc's revelation that Plekne, whose boats had sunk far out at sea, had swum a hundred miles or better to reach one of the kelp cities.

The professor marvelled at the lack of ego on the part of the Plekne, who, rather than maintain the idea that they were descendants of god-like individuals far above the status of the Nacac, honestly accepted the conclusive proofs of their evolutionary transcendency. This was surprising in view of their undeveloped state of progress and crude, simple routine of life. They were happily unburdened with the theological superstitions and weird practices which the professor had found were all too common among the less intelligent order of creatures to be found among the worlds of the universe.

The professor met Ogweg, he who had ordered the attack on the space ship. The truculent Pleknan admitted his mistake in thinking the Zoromes to be a party of the raiding Uchke. Professor Jameson could not help but admire Ogweg's pluck in deliberately attacking a superior power. Chopoc had spoken uneasily of the Uchke's terrible weapons which were unloosed among them at the first signs of disobedience or aggression. Ogweg's act had been a brave, yet futile, gesture. Rather than submit peacefully to the raiders, he preferred combat. This attitude contrasted sharply with the fatalistic resignation of the other Pleckne who admired, yet deplored, Ogweg's fatal resolve.

The machine men found much to interest them in the kelp city. They made friends with the Nacac who were dumb and could not speak, but whose simple thoughts were plain to the consciousness

of the Zoromes. Much to the surprise of the Plekne, the machine men were able to direct the actions of the mermen to a considerable extent by mental suggestion.

Lingering in the vicinity of the kelp city, the machine men hoped for a sight of the deep water dwellers who were wont to raid the kelp cities for slaves. The Uchke were evidently a superior, though cruel, race, and the machine men desired to learn more about them. If possible, the Zoromes hoped to arrange for the security of the Plekne before they left. Sympathetic sentiment had been aroused for the honest and simple creatures.

CHAPTER II

SEVERAL rotations of the hydrosphere brought successive periods of daylight and darkness upon the kelp city. Professor Jameson and a number of the machine men had gone with Chopoc to the treasure room of the city. The machine men could scarcely believe their eyes when they found the treasure of the Pelkne to consist merely of stones, varying in shape and size from pebbles to rocks half as large as the machine men's heads. They were certainly rarities to the Pelkne, though they were the same as those rocks which might have been found in endless quantities on any world other than the hydrosphere.

"Chopoc, where did all these come from?" asked the professor.

"From the stomachs of fish which are found from time to time floating dead on the water. Their bodies are generally burst open."

"Because of a lack of sufficient pressure after they leave the lower levels," mused the machine man, more to himself than to the rest.

He said no more on the subject, but on the way back to the space ship, which had been left in charge of the fourteen remaining Zoromes, he thought much about the fish with the stones inside them. The ship of Zor rested quietly on the tranquil water several hundred feet offshore. After the first landing in the city, the machine men had kept the space ship out on the ocean. The immense weight of the stellar flyer had wreaked havoc with the kelp laced avenue upon which it had first come to rest.

Professor Jameson with 744U-21, 6W-438, 88ZQ4, 6N-24 and 56F-450, was not far from the boats of the Plekne, which waited to take them to the space ship, when a sudden geyser of water shot skyward out of the ocean a short distance away. A large object spewed out of the fountain and plunged back into the water where it bobbed up and down on the surface. Instantly a wail and cry ran through the ranks of the Plekne, as the fountain subsided and the long, ominous hulk headed slowly for the kelp city.

"The Uchke! The raiders!"

Younger Plekne were hustled into the houses where they skulked furtively, knowing what little chances there were of escaping the hawk eyes of the brutal invaders of the peace and happiness of the kelp city. Uneasiness, hate and intense fear throbbed in the excited conversations of the Plekne.

Professor Jameson and his metal companions stopped short near the water's edge on the close-woven kelp. Zoromes on the space ship waited for the initiative of the grim raider from down under. Deadly, destroying apparatus was trained upon it, while an invisible screen of repulsion force lay protectively about the space ship. They had not long to wait before the Uchke showed their hand.

A brilliant ray shot out toward the six machine men and they felt themselves hurled into the air. Beneath them, the kelp had received most of the power. A deep hole had been blasted completely

through the city's edge, and down towards this yawning cavity tumbled the six Zoromes. In his hurtling fall, Professor Jameson caught a fleeting glimpse of the Uchke vessel which had fired upon them. A bright glare of light enfolded it, and the submarine invader disappeared before the unleashed destruction from the space ship of Zor.

Yellow green water engulfed the professor. Down into the depths his metal weight dragged him in spite of his desperate efforts to seize broken strands of kelp. A short distance to one side, he saw the struggling form of 88ZQ4. The other machine men were nowhere in sight.

"88ZQ4!" he called. "Join tentacles with me! Let us keep together!"

BY turning his body slightly sideways, 88ZQ4's descent became merged with that of the professor, who was slightly below him. Frantically, Professor Jameson thrashed his metal limbs, checking his drop sufficiently for 88ZQ4's metal legs to come within reach of an upflung tentacle. The two machine men sank deeper into the hydrosphere's watery grave, their bodies joined by two tightly wound tentacles.

The professor knew that if he and Brlx, now known as 88ZQ4, could remain together, they would be of more help to each other than if they were separated. He searched with straining eyes through the darkening, murky depths for their four companions, but he saw none of them. Had the ray of the Uchke destroyed them? He wondered. Perhaps they had been fortunate enough to have fallen back upon solid kelp.

A shadowy form flitted past them in the yellow semi-gloom. It turned, circled them in a downward spiral, following their descent into the watery depths. Then it came close, and in the deepening shadows Professor Jameson made it out for what it truly was.

"One of the Nacac!" he exclaimed, radiating rapid instructions to the curious fish.

Recognizing the machine men, and obeying the telepathic suggestion forced so strongly upon its mind, the merman came close and allowed the two machine men to fasten their tenatcles to him. He swished his strong, jointed upper fins and vibrated his tail in an upward movement, but his best efforts only accomplished a slower descent of the Zoromes into the bowels of the hydrosphere.

Two more of the Nacac appeared out of the surrounding sea and lent their aid. The machine men commenced a slow rise, but Professor Jameson realized that they had already sunk miles through the clear water. He knew that the three Nacac would tire of the difficult task long ere they reached the surface, so he detailed one of them to swim away for more help. He also advised the two remaining mermen to conserve their efforts until help arrived, keeping the two machine men from sinking deeper. Since his reception into the ranks of the machine men of Zor, Professor Jameson could not recollect having been in a more helpless position.

With a great deal of relief, he saw a cloud appear far above them, grow and resolve itself into the semblance of small, separate clouds which were the Nacac composing the rescue party. They were none too soon in their coming, for the two mermen supporting the Zoromes were rapidly tiring of their exertions at this depth which was far deeper than they ordinarily swam.

While the rescue party was still some fifty feet above the two machine men and their two supporters, a dark shape of gigantic proportions swam up from below them. Large, baleful eyes regarded them hungrily, while the cavernous mouth opened and rushed at them, frightful jaws gleaming. A shroud of darkness leaped over the professor's vision, and he

felt himself squeezed between cold, clammy walls, A clashing and grating of strong jaws severed a tentacle and threatened to crush his cubed body, but the strong metal resisted the terrific leverage.

From above, the Nacac froze in sudden horror, as they saw two of their companions and the two machine men swallowed by the voracious fish. In terror they sped for the upper levels away from the frightful monster of the dark, deep strata, shooting towards the surface with the speed of arrows. With them, they bore a horrid tale to the machine-men in the space ship far above.

The professor was aware of a rippling vibration which squeezed him between cold, soft walls. Something clanked against him with a dull sound. It was the metal body of 88ZQ4. Professor Jameson called out to find how his companion had fared.

"Are you all right?"

"Two of my tentacles are gone," came the quick reply, "but aside from that I seem to be still intact."

THE machine men presently felt themselves toppled into an abyss, but the sensation was short, for they landed softly into a pulp mass from which they staggered to a standing position. Beneath them, the cold, rough wall shuddered at the contact of their metal feet.

"We're in the fish's stomach!" the professor exclaimed.

He flashed on several bright lights set deep in his cubed body. 88ZQ4 followed suit. They examined their living dungeon, awed and mystified for a moment by the sudden, eerie experience of being eaten alive. The pulpy mass which rose high about them bubbled and surged past them slowly like a subterranean river of mud. The machine men recognized it as bits of partly digested fish. Several sections of the two ill-fated Nacas revealed quite significantly the fate which had claimed them. The living ceiling above the heads of the two Zoromes rose and fell, touching the tips of their heads, then revolting as if in protest.

"This fish is going to find us pretty hard to digest," the professor quipped. "We'll be one stomachache he won't forget."

Calm and sober, 88ZQ4 remained unmoved by the professor's touch of earthly humor. 88ZQ4 had been a Triped, one of a race of serious-minded creatures who were practical and calculating to an extreme. The brain transposition had left Brix's grave disposition unchanged, just as Professor Jameson's conversion had failed to remove his humor.

"What are we to do?" 88ZQ4 asked.

"That is open to question."

Their prison slanted quite suddenly and stood on end. The machine men hurtled together as the walls of the monster's stomach suddenly clamped tight.

"He is heading for deeper water!"

By the change in the direction of gravity, the machine men were aware that the fish was whirling and changing directions rapidly, yet always seeking lower levels.

"We're in deeper water now," observed the professor, noting the constricting walls of the sea monster's stomach. "The greater pressure evidently aids the digestion of this fish, and he instinctively goes to deeper levels when troubled in this manner."

"Let us escape from here," 8ZQ48 suggested. "If we fall to the center of the hydrosphere, we may stand a better chance of rescue than if we let this fish carry us all over the globe."

"The only escape I can see is to cut our way out."

"You mean that heat ray you carry in your fore tentacle?" queried 88ZQ4.

"Exactly."

"The tail spin we just went through

won't be anything at all to what will come when you start burning a hole through this fish."

"True enough," Professor Jameson agreed. "We must kill him first."

The machine man carefully estimated the direction in which he expected the sea monster's heart to be and then levelled the attached cylinder of the heat ray against the gleaming wall. The cylinder was a weapon he had fashioned especially for himself after the battle with the Emkls in the blue dimension when the close fighting had deprived him of the clumsy ray-gun.

The cylinder glowed as an intense white light became focussed. Professor Jameson braced himself tightly against the constricting walls as the agonized fish gave a furious lunge, clipping the water at berserk speed, seeking to escape the terrible gnawing deep in its vitals. Soon the frantic efforts became weaker. Professor Jameson noted with satisfaction that the walls of the sea monster's stomach were relaxing their vicious clutch, though they still sagged inward from the pressure of the depths.

THE floor of the stomach became the ceiling as the machine men were once more tumbled about. The dead fish had keeled over on its back. Patiently, the machine men waited for the fish to become settled before they tried to tunnel their way free of the great body. Professor Jameson gloomily contemplated the partially digested remains of his late friends, the faithful Nacac, who had died in a vain effort to aid them.

"If they didn't survive, then what chance did Jonah have?" the professor mused.

"Who is this Jonah?" queried 88ZQ4. "Was he a Zorome?"

"No," replied the professor, and he related to 88ZQ4 the earthly tale which many of his people had actually believed over some forty million long years ago.

"Impossible for him to have lived," was 88ZQ4's comment. "Jonah was no machine man."

"Do you suppose there is any chance of this fish floating to the top of the water now that he is dead?" 88ZQ4 asked.

Professor Jameson pointed to the trickle of water which was issuing from the creature's gullet, slowly filling the stomach. "If there was a chance of it once, there is none now. We're going down."

The machine men set to work burning a passage out of the giant fish they had killed. They took what the professor believed to be the shortest route, which was upward now that the fish lay on its back. From outside there came a sudden bump which jarred the entire fish.

"What was that?"

The body of the fish rolled slowly to one side. Professor Jameson finished the black circle he had been cutting. A final rush of water from outside burst into the fish's stomach, forcing out the half charred residue left by the heat cylinder. The dead body was at rest. Followed by 88ZQ4, Professor Jameson climbed out the opening he had made and slid down the belly of the giant fish.

All about them lay the vast darkness of the deep sea, punctuated here and there by the ghostly lights of marine creatures. Professor Jameson's feet struck something solid. Once more the two Zoromes flashed their body lights to lessen the intensity of the darkness about them.

Small, silvery fish with long, silky trailers scattered from the path of the light beams in myriad waves. Weird, deep sea denizens with frightful faces ogled at the machine men in surprise and contemplation. The two Zoromes found themselves standing in several feet of light ooze. At a distance the multitude of silvery fish were busy feeding off the

ooze like real grazing animals of the deep.

"We're on the bottom, all right," was the professor's comment. "There is no telling how many hundreds of miles of water there are above us."

"But 744U-21 told us this was a perfect hydrosphere," reminded 88ZQ4.

"That was just his opinion," said the professor. "I was inclined to believe it myself until I saw the treasure of the Plekne."

"The stones?"

"Yes. It suggested pretty strongly that this planet possessed a rocky core. Just how big this core is we have yet to discover."

The two machine men waded through the ooze, lost on the hydrosphere's sea bottom. All kinds of strange fish swam and crawled about them, some scurrying from the light, others staring at the two Zoromes stupidly. Many of the fish were equipped with natural lights of their own which they flashed on and off at will.

A sudden warning from 88ZQ4 made the professor glance up just in time to see semi-transparent jaws close upon him. Unconsciously, he had walked into the cavernous jaws laid in waiting for unwary creatures of the deep sea. The professor found himself enclosed by a bulbous, transparent body. He saw 88-ZQ4 quite plainly a short distance away, yet his tentacles encountered a scarcely visible wall which prevented his escape. In desperation, the professor turned on his heat ray. It did not function. Not until then did the machine man realize that he had exhausted the charges of the weapon in escape from the fish which had swallowed 88ZQ4 and himself.

HE threshed about wildly with his tentacles, fearing any moment that the ocean denizen would swim away with him, separating him from his fellow Zorome. But the fish did nothing of the kind, and it suddenly occurred to Professor Jameson that, unlike the ocean rover into whose capacious jaws they had recently fallen, this creature waited for his meals to come to him rather than go in search for them. Because of such a lazy habit, evolutionary tendencies had long ago deprived this species of mobile parts and had bequeathed instead the faculty of partial invisibility.

One of the professor's threshing tentacles suddenly broke through the tough texture of the fish's body, and with a mighty effort the machine-man ripped the tiny tear into a gaping rent through which he stepped and joined 88ZQ4.

"They all think we are something good to eat," was his sally. "That's the only diversion down here, the one great law of the sea, hunting, killing and eating—then to be eaten. It represents an endless cycle. Larger fish eat the smaller fish and are in turn eaten by still bigger fish, and so on up. The biggest fish eventually have their day and are devoured by minute organisms of the sea which in turn die and fall to the bottom of the sea as ooze which is eaten by the smaller fishes."

The machine men toiled onward through the ooze which sometimes rose above their heads, making for difficult progress, and then again disappearing entirely from the ocean floor. Professor Jameson was amazed at the clarity of the water at this unheard of depth. Their lights shone far ahead of them, and, when they were turned off, luminescent fishes were visible for quite a distance.

During one of these latter periods, the machine men saw far ahead of them a great light which glowed from below the horizon. Rapidly they turned their steps that way, for it did not appear to be the emanations of a fish, but rather of a mechanical means like the lights of the machine men.

"Perhaps it is light from our four com-

rades who were caught with us in the explosion," 88ZQ4 suggested.

"I doubt it very much," was the professor's reply. "This light is far away and is too great for even that, which four machine men might merge into a single brilliance."

The two Zoromes plodded onward through the sucking ooze toward the light which spread far upward into the murky waters. Quite suddenly the light disappeared, to be replaced once more by the melancholy darkness of the great, silent depths. But the machine men had the general direction and kept onward. At the professor's suggestion, they showed no more lights. The dawn of comprehension was striking his mind, and his suspicions were brightening into certainty.

They had come a long way over the curved, ocean floor when unexpectedly the great light shot up just a short distance ahead of them, dazzling and intense. Professor Jameson drew his companion down into the ooze so that only the apex of their metal heads were left in sight. From this position, the two single eyes stared at the scene before them. A square, flat surface of sea bottom lay clear of the ooze, and the two Zoromes recognized it as a metal platform. From above, a huge, elongated vessel sank slowly downward into the bright glow of the light.

"The Uchke!" 88ZQ4 exclaimed.

"As I suspected!" said the professor. "Here is where they stay!"

AS the machine men watched from their places of concealment, they saw the metal platform divide in two and slide back from the center. Into the cavity beneath slowly sank the submarine of the dominant Uchke. Returned from a raid on one of the numerous kelp cities, their ship probably contained many slaves from the ranks of the Plekne. When the top of the vessel had disappeared beneath the level of the ocean floor, the two parts of the metal platform rolled together once more.

"There's an air-lock in under that!" was the professor's emphatic announcement. "Those Uchke are an air breathing race, and somewhere in this rock core they have a hide-out!"

"It doesn't seem reasonable," was 88ZQ4's opinion. "They are air breathers, yet they choose to live under artificial conditions rather than live on the surface."

"It is unnatural," the professor agreed. "We may find out why they do this."

"How?"

"We're entering the air lock."

"But it is clamped shut," protested 88ZQ4.

"Wait until another submarine comes in or goes out," promised the resourceful professor. "Then we may get our chance."

In the meantime, the light had disappeared, and they were in darkness once more. Patiently they waited. It was not long before the great light sprang into dazzling brilliance once more. Far above them, the machine men saw two of the Uchke raiders slowly descending. While they watched, the metal parts of the air-lock entrance slid aside, and a vessel bobbed up out of the air lock. It swung sidewise over the spot where Professor Jameson and 88ZQ4 knelt in the concealing ooze. It was evident that the air lock saw a great deal of traffic.

"Now's our chance!" the professor cried. "Run along under the vessel and duck down inside!"

88Z&4 executed the move with alacrity, closely followed by 21MM392. They bumped against the bottom of a water filled chamber.

"Into a corner!" the professor urged, remembering that the vessels of the Uchke were rounded.

Professor Jameson fully realized the perils of discovery, but that was a gamble they must take. In his own mind, he cherished the idea of stealing one of the submersible crafts and executing a return to the surface. The two machine men drew back into the darkness of a corner as the first vessel slowly sank to rest on the bottom of the chamber with a dull thud. They watched with rising interest the vessel's slow movement towards the farther wall. The wall sank slowly inward, and the submarine entered. Immediately after, the wall rose back into place.

While the second vessel dropped into the entrance, a fountain of bubbles gushed from valve openings around the wall opposite the machine men. Water was being forced out under heavy pressure.

"Come," said the professor as he walked up behind the second craft and clung to the exterior apparatus of the submarine.

88ZQ4 took his position beside 21M-M392. Quite suddenly a strong current of water exerted itself upon their metal bodies with a pulling tendency. They clung tighter with their tentacles against the inrush of water into the air-lock. The vessel moved forward, and they were aware that the wall had once more lowered.

The water in the air-lock frothed and bubbled in an ever decreasing level as the air forced it out upon the ocean bed. The two machine men gradually lost the slight buoyancy the water had given them and became heavier. Jumping off the side of the submersible vessel they scuttled into the darkness of a niche. Their action came none too soon. A metal doorway opened in the craft and several of the Uchke filed out. It was the machine men's first view of the cruel dwellers of the deep who preyed so constantly upon the helpless Plekne.

THEY were like figments of an evil dream, their ruthlessness and brutal character plainly stamped on beetling visages. Professor Jameson was strongly reminded of the snarling face of a gorilla he had once seen long ago, during his earthly life. But there was no hair on the faces of the Uchke, and their foreheads were prominent instead of sloping, revealing that they were advanced thinkers. Their bodies, however, were small and out of proportion to the size of their heads. Four upper appendages branched forth, terminating in clawed digits. Two stumpy legs afforded the creatures movement.

From out of the submarine, more than a dozen unfortunate Plekne were roughly hustled and joined with a group emerging from the first craft farther down the chamber. Dejected and helpless, the Plekne represented the extreme state of oppression they had ultimately reached. Professor Jameson marveled to himself that individuals like Ogweg ever were born among the subjected Plekne.

"Wait until they all leave," the professor told 88ZQ4, "and then we shall see what can be done about stealing one of these vessels."

"But what about the wall?" asked 88ZQ4. "We cannot lower that."

"Perhaps it is operated by remote control from inside the vessel," the professor suggested hopefully. "Anyways, we must avoid detection until they all go."

When the Uchke had all disappeared, the professor and his companion emerged from their concealment and stole noiselessly down the long hall of assembled undersea prowlers. They were nearly at the termination of the submarine port. The professor was examining the last ship in line, when the unexpected happened. A blaze of light shot suddenly from the floor ahead of them, and up through a wide, cylindrical shaft, which the machine men had failed to see in the

gloom, shot a car laden with the Uchke.

It was dismay rather than fear which prompted the two Zoromes to drop back out of sight. But already several of the undersea dwellers had caught the gleam of light upon moving metal, and they were out of the car in pursuit of the shadowy forms just beyond the *aura* of their light.

Professor Jameson uttered a few mental suggestions, and the two machine men took their stand. The first Uchke to approach was surprised when a curling tentacle lashed out and applied a mighty contraction about his neck. His surprise lasted less than a minute. The others, seven in number, leaped into the fray, and for a moment all was a mixed confusion of tentacles, grappling arms, cubed bodies and kicking legs, both flesh and metal.

Anguished cries rang out as the machine men in their cold, calculating manner found vital portions of the Uchke anatomies. The latter were no match for their two metal adversaries and would have been no serious menace to even one of them in hand-to-hand combat.

The result of the conflict was already a foregone conclusion when one of the Uchke, jumping free for a moment, pulled an object from his belt. A white ray of light leaped forward full upon the professor who had already accounted for two of the Uchke and was looking for a third victim. The power hurtled him over and over as if a terrible windstorm of unbelievable velocity had quickly arisen in the undersea chamber. His brain leaped into oblivion.

CHAPTER III

WHEN Professor Jameson recovered his senses, he felt soft, nimble fingers working upon his metal body, and a strange metal rasped and clattered against his legs. As his brain cleared, he saw that he was still in the chamber of the undersea craft. Two of the Uchke were busy removing his metal legs. Like a shot, he lashed out with his tentacles and caught the raiders of the hydrosphere in a tight grip. Swinging them over his reclining body, he squeezed the life out of them and then flung their dead bodies against the nearest wall. A mental supplication of help broke in upon his brain.

"21MM392!"

The professor essayed to rise, but discovered that while he had been unconscious from the blast of the power gun, which would easily have killed a flesh and blood creature, the devilish Uchke had succeeded in removing three of his four metal legs. They had been busy with their implements on the remaining leg, when the professor had surprised them with his recovery.

"21MM392! Come!"

The cry permeated Professor Jameson's brain once more with its morbid suggestion of dire disaster. The machine man turned to look upon a nerve jolting scene. 88ZQ4, stripped of his metal legs and tentacles, was being dragged over the floor by the remaining Uchkek. The creature's face darkened into a set snarl of derisive hate, as he saw the professor's instinctive effort to rise. The Uchkek, seizing the metal head of 88ZQ4 in a strong grip, slowly dragged the metal torso of the machine man toward the shaft where the elevator car stood.

Professor Jameson made another effort to rise, steadying himself with his tentacles, but, realizing the futility of it, he started crawling to intercept the Uchkek before the latter reached the shaft with his inert burden. Using the one leg to shove and the tentacles to pull, he edged slowly in the direction of the shaft. The progress of the Uchkek was handicapped by the heavy weight of the machine-man's head and body which he was endeavoring to drag to the elevator car. Had he dared, the Uchke would have returned

to the side of one of his fallen companions for a power gun, with which to dispatch the menacing monstrosity of metal which crawled so slowly yet surely to head him off. But he dared not pass by those horirble tentacles which waved at him so threateningly.

88ZQ4, without workable appendages, was helpless. The professor increased his pace. The Uchke sweated and pulled the harder, measuring the distance to the shaft with alarmed eye. The professor was farther away, yet he was increasing his speed. It was a grim race, and the raider of the inner world was of no mind to give up his metal prize. The professor feared most of all, that the Uchke would escape and sound an alarm.

Eager to return to his comrades with the trophy of 88ZQ4's head and body, the Uchke taxed his wits to best the oncoming machine man. Setting the extremity of 88ZQ4's cubed body in a rolling motion, he skillfully rolled the conical head in his four arms, guiding the helpless machine man towards the car. He reached it first, only a short distance ahead of the professor.

Once inside the car, the Uchke slammed shut the door against which the professor gave a terrific lunge a split second later. Simultaneously, the car shot downward, rasping against Professor Jameson's metal body with such a rapid speed that gave him no chance to regain his equilibrium. Clutching wildly at the lip of the broad shaft, the machine man toppled into the black depths below him. He expected to crash upon the top of the descending car at any moment, smashing flat his head and scattering the all important brains, the only death blow ever suffered by a machine man.

BUT still he hurtled downward, and to his bewilderment and increased horror there was no cessation of his accelerating fall. The velocity of his drop rapidly increased, so that the air in the shaft fairly shrieked past him. He wondered vaguely where the elevator had gone—and how soon he would smash himself into a pile of lifeless, inert junk.

Sheer amazement smote the professor as he fell lightly upon the top of what he readily assumed to be the elevator car of the fleeing Uchke, yet his sensations of dropping rapidly were but slightly diminished. Truth flooded in upon his brain, washing away the flotsam of doubt, wonder and incredulity. The downward flight of the elevator was so fast that it had been with difficulty that his rapidly accelerated fall had finally caused him to overtake it.

With clutching tentacles, the professor gripped the roof of the speeding car firmly. Beneath him lay the helpless metal body of 88ZQ4, formerly Brix the Triped, being taken to the recluse of the Uchke. Where was this habitation of the deep sea raiders? The machine man pondered the probabilities. They had already fallen many miles. Previously, Professor Jameson had estimated the diameter of the hydrosphere's core to be no greater than a hundred miles, basing his figures upon the sea bottom's curvature. The rendezvous of the Uchke must be at the center of the core.

While the professor was engaged with these thoughts, the elevator's wild speed became braked and the mad momentum checked. Gradual light replaced the darkness as the car slowed to a stop. It was well for the machine man that he clung tightly with his tentacles, for a sudden tendency to fall upward was exerted upon his body, lifting him away from the car. He realized a confusion of directions. Which way was down, and which way was up? Gravity had seemingly reversed itself. He was no longer on the top of the elevator car. He now clung to the bottom. Professor Jameson knew that he had reached the

world of the Uchke, directly in the center of the rocky core. Letting go his hold upon the car, he dropped upon a small platform below him and found concealment in the gloom of a flight of steps.

He saw the Uchke open the door of the car, heard him yell to his companions who appeared and helped him remove the cumbersome body of the machine man, 88ZQ4. Impulsively, the professor sent out a mental call to the helpless Zorome, telling him of his presence. Unknown to the Uchke, the two machine men held a mental conversation. The brain emanations were too high to be caught by the dwellers of the rock-core. In fact, had the Zoromes wished to communicate with them, a concentration of thought projection would have been necessary.

From his spot of concealment, Professor Jameson saw the blustering and grinning creatures of the inner world carry his helpless comrade out of sight through a wide doorway. The captive machine man, according to the professor's instructions, kept him posted so that the latter might follow and await a favorable opportunity.

"They are carrying me upward," 88-ZQ4 radiated to the professor who skulked unseen in the rear of the stairway. "We are entering an airship. There are many ships here. We are sliding off a platform."

"Are the ships being guarded?" the professor queried.

"Several of the Uchke are about. If you come this way, go careful. 21MM-392! You should see where I am now! It is like a world turned inside out! The land slopes up to meet the horizon which is really a muddled haze of the inner surface of the rock core! It is the world of the Uchke!"

"How far across is it?" asked the professor, forgetting the immediate peril for the moment.

"Twenty miles easily, probably more. The airship is rising into this vast immensity of the sphere's center. We are heading for a huge ball, a floating island of dazzling light which seems to be sending synthetic daylight to the surrounding world. It is nearly a mile through, I should judge, and there are many buildings on it."

THE emanations of 88ZQ4's brain grew fainter as the airship which was bearing him away flew farther from the mainland.

"What holds the island in place?" asked the professor.

"A mutual attraction in all directions of the surrounding globe," was 88ZQ4's faint reply. "There are no visible means of support."

"I must follow you!"

"We are shooting straight for the island. That is where they seem to be taking——"

The brain impulses of 88ZQ4 died away in flickering waves of unintelligible thoughts. The ship bearing the prisoner had passed beyond the faculties of the machine men for communication. Professor Jameson, a crippled machine man, saw no one in sight. The Uchke summoned by 88ZQ4's captor had all gone. Slowly, partly to avoid making more noise than could be helped, and mainly because with only one leg he could make no better progress, the professor crept up the stairway and through the entrance to the airship hangar. A surprised Uchke stared him in the face. With the speed of thought, the professor flung a tentacle around his neck, strangled him and threw the inert body into the chamber below. The Uchke had been just about ready to enter a nearby airship. From beyond, the professor heard the mingled voices of more of the Uchke clustered about their various ships. Professor Jameson lost no time in entering the airship.

Peeping from the windows, he saw many other ships scattered about, the Uchke going in and out of them. Many of the enslaved Plekne were also in sight, engaged in menial tasks for the most part. Aside from a careful notation of the direction, in which the airships came and went, the professor paid no more attention to outside interests. The controls of the craft had him puzzled for a moment, and he was busy deciphering their various uses, when a startled cry broke forth from behind him.

The metal eyeshutters on that side of his head lifted inquiringly, and he saw a frightened Pleknan regarding him with wide, frightened eyes.

"Do not cry out!" the professor warned him.

The man from the kelp city stood dumb in surprise. No sound had issued from this metal monstrosity which he had caught moving about inside the ship, yet a silent command had been given him. Accustomed to obeying orders, the Pleknan remained immovable, his thoughts a bewildered chaos of fear, wonder and perplexity. The machine man immediately followed up his advantage.

"I am a friend of the Plekne from the upper world," the professor informed him. "Tell me how this airship is operated and we may escape."

"Escape!" the Pleknan uttered this one word aloud.

"Yes. Do as I tell you. I have a comrade who must be rescued."

THE Pleknan recovered sufficiently from his astonishment to come to the aid of the machine man, and rapidly he explained the uses of the various controls.

"You know much about these ships," the professor told him. "Will you pilot for me?"

"Where—where shall we go?"

"To the very center of this inner world—that bright island of the air."

"You mean the island of light," was the Pleknan's reply, fashioning his thoughts after the mental suggestions of the Zorome.

"It is where 88ZQ4 was taken."

"Tell me, are there many of your kind?" the Pleknan inquired, gaining confidence from the kindly manner of the machine man.

As the Pleknan guided the ship along the low ceiled hangar towards the entrance, Professor Jameson told him briefly how the space ship of the Zoromes had come to the world of water. Much to the impatience of the professor, a halt was necessary while several ships landed and entered the Uchke hangar.

"Are you from the world of the Uchke?"

"From the world of the Uchke?" the professor echoed. "Is this not the world of the Uchke?"

"Only a colony where all the slaves from the surface are first brought. I am Bwengik. We captive Plekne know a great deal more of our enemies than those upon the surface. Once taken here, we never see our cities again."

"Who are these Uchke?" the professor asked. "What world are you talking about?"

"I myself do not quite understand what the Uchke mean. To us Plekne who are captives here, there are only two worlds, the outer world of water and this strange inner world of solidity. Yet, from time to time, many of us are taken away from here and up through the water to a great world which the Uchke talk about as home. We Plekne are constantly being taken from the kelp cities, trained here for a definite period of time and then rushed off to this fabled world which we have never seen. It is said that the Plekne do not live long in this other world, and that is why the Uchke

keep themselves supplied with slaves from the kelp cities."

The professor had made so many astounding discoveries since coming to this weird planet that this new surprise came at a time when the affairs of the hydrosphere were still in a rather disorganized state of comprehension. But at last the professor believed that he perceived a glimmering of the real truth.

They were off the platform, shooting into the air. A strange sight lay spread in panoramic perspective before the machine man. The inner world lay below him like a curved bowl, a continuous city rising upward and away into the horizon. The island of light represented a glorious spectacle. Like a great dazzling gem, it floated midway in the center of the atmosphere globe. Huge, artificial sun-lamps threw their illuminating beams in every direction. Situated between these gigantic lamps were visible the spires and other architectural features of many buildings.

"What are those buildings for?"

"They are the prisons, mostly. The storerooms are also located here."

"The prisons—drive past them," the professor ordered. "Circle high."

The Pleknan did as he was directed. Professor Jameson sent out a call to his fellow machine man who, the last he had heard, was being taken here.

"88ZQ4! I have come! Do you hear me?"

"We hear you, 21MM392!" came the startling reply. "But 88ZQ4 does not hear!"

FEAR struck simultaneously with stark amazement. Did the ingenuity of the Uchke possess a machine for revelation of projected thoughts? Was 88ZQ4 dead, that he did not hear? Were the Uchke mocking his futile efforts? For a moment, the professor's mind was crowded with terrible thoughts which left him baffled and unnerved. But the next transference to reach him relieved his apprehension considerably.

"Quiet your fears, 21MM392. It is I, 744U-21, your very good friend."

"Where are you?"

"In company with 6W-438, 6N-24 and 56F-450 in the prison of the Uchke on their island of light."

"How did you get there?"

"When the explosion came, we sank directly to the sea bottom. I believed we would come to rest at a common level in the center of the hydrosphere. Imagine my surprise to discover a rocky core to this world of water."

"I know," said the professor. "Your previous opinion visualized a perfect hydrosphere. I had my doubts after leaving the treasure-house of the Plekne."

"Yes—it seems this world either possessed a rock core in the first place or else meteoric showers throughout the ages have built one, and if this is——"

"But the Uchke!" exclaimed the professor, cutting short the scientific theorizing of his fellow Zorome. "How did you fall into their hands?"

"One of their submarine prowlers found us on the sea bottom. They knocked us over with a power-release which did not kill us. The next thing we knew, we were entering an air lock of this world within a world."

"Without tentacles or legs," supplemented 6W-438. "We are still that way—helpless to move about."

"88ZQ4 told us your story," said 56F-450. "He is here with us."

"You suggested something wrong with him. What is it?"

"88ZQ4 is senseless from a power shot of the Uchke. It seems he clamped one of his eye shutters down on the finger of a too inquisitive Uchkek."

"They have removed our limbs," 744U-21 lamented. "Soon, they expected to operate on our heads. It will be fare-

well for us when that time comes. At this moment they are preparing for it."

"All they have of me are three legs!" Professor Jameson swore vehemently. "If I could only get a message out to the space ship!"

"Not much chance of that unless you go to it direct through one of the air-locks. Then you would need a submarine."

"You might be able to make it," was 56F-450's optimistic suggestion.

"And leave you five here to have your heads split open?" Professor Jameson protested. "Not much!"

"But what can you do alone against an entire city?" 744U-21 challenged. "You are unarmed and have scarcely more than half your appendages."

"They have not caught me yet," replied the intrepid machine man, "and until they do the battle is not lost."

As if to threaten this statement, several airships of the Uchke bore down on the professor's circling ship suggestively.

"They have discovered the Uchke you killed!" cried Bwengik. "They know that this is his ship!"

"Put on speed!" the professor ordered. "Elude them! But do not go far away from the island of light!"

Professor Jameson was doing some desperate thinking. Trouble dogged their heels, and the situation called for action. The Pleknan displayed skillful control of the ship as it accelerated around the island of light like a tiny satellite, momentarily throwing the pursuers off the track. The professor was still in a state of indecision when a call came from the captive machine men.

"21MM392! The Uchke are coming with their tools! They are about to take our heads apart!"

MAD inspiration struck the professor. The decision had been forced upon him. There was no longer an alternative to consider. He stared down at the vast network of window designs in the prison buildings.

"Shine your lights!" Professor Jameson told his metal companions, hoping against hope that the rascally Uchke had not tampered with the body illuminators.

Almost immediately, one of the thousands of windows below the circling ship became suffused with a subdued glow. The professor marked it carefully.

The airships!" exclaimed Bwengik. "They have us cornered! We're lost!"

The terrorized Pleknan pointed to the many ships of the Uchke, which were closing in from all sides. They were trapped. A general alarm had been issued, and the stolen craft was fast becoming the concentration point for all aircraft in the sky. Like destroying ants, they closed in viciously upon their circling prey. Bwengik, confused, seeing no avenue of escape, became frozen at the control board, stupified. The machine man pushed the Pleknan out of the way and seized the direction lever himself. A cry from below hastened his action.

"They have removed my head!" wailed 6W-438. "They are trying to pry it apart!"

As the cortege of circling ships drew in close, the professor, having previously watched Bwengik at the controls, looped the ship in an incomplete circle. The craft never righted itself, shooting like a plummet for the prison buildings of the inner world. Bwengik gave voice to a cry of mortal terror as the island of light rushed swiftly at them.

With a terrific smash, they struck the building close to the glowing window. The professor dared come no closer. Both Zorome and Pleknan were hurled from their positions and battered about inside the craft as it tore through the side of the prison.

Professor Jameson arose from the mass of wreckage little the worse for the

terrific crash. He and Bwengik had been in the rear of the ship when it struck. The front portion was crushed, a jumbled mass of ragged metal. Professor Jameson moved a bit uncertainly towards the inert body of the Pleknan. Blood flowed sluggishly from several wounds. Forcing himself along by shoving his one leg, the machine man lifted the limp form in his tentacles.

Bwengik was dead. His flesh and blood body had been unable to withstand the tremendous shock of the impact. Though ground beneath the heel of the Uchke for the greater share of his life, the Pleknan had died a heroic death. Then and there, Professor Jameson swore fervently that, if he won out against the Uchke, and were it within his power to do so, he would free the unfortunate Plekne from the cruel bondage they suffered.

Ripping away the debris from a gaping tear in the ship, Professor Jameson crawled forth into the evil-smelling prison on the island of light. Several Uchke lay dead on the floor, partially buried beneath the bulk of the wedged airship. The machine man had struck his first blow in the cause of his comrades, having unwittingly snuffed out the lives of several enemies in the fall of the vessel.

The professor recollected that it had been, to the right of the spot where the ship had crashed, where he had seen the glow from the cell window. He made his way in this direction, crawling out from under a sudden fall of debris loosened by the crash. The machine man emerged into a corridor just in time to run into three startled Uchke come to investigate the fallen ship. Taking advantage of their mute surprise, the professor lashed out with three tentacles, caching three soft throats in contracting, metal loops. He choked the life from them rapidly, and then pilfered the dead bodies for the power guns they carried. With the three weapons, Professor Jameson crawled into the cell from which the three Uchke had just come.

THERE before him, resting on their square metal bases, stood his five companions, immovable except for the metal eye shutters. Without legs, without tentacles, they were helpless indeed. The head of 6N-24 hung loosely to the metal body, while the head of 6W-438 lay sideways on the floor. Professor Jameson's collision with the building had been timed none too soon, interrupting the grim work of the Uchke.

"How much better off are we now?" suggested 744U-21. "It is only a respite. Soon, the Uchke will be down upon us in a swarming, overwhelming horde."

"I have weapons!" exclaimed the professor. "We can make a stand of some kind!"

"You will make the stand, 21MM392," spoke the head of 6W-438 from its position on the floor. "We are helpless."

The pattering of many feet, on the floor of the corridor outside, precluded further communication. Professor Jameson waited, power guns held tense. Into the room burst a horde of the Uchke, their weapons ready. But they were unprepared for the sight which met their eyes. There in front of their five metal captives stood the crippled machine-man, defiant and purposeful. The scene flitted across their vision for a split second to be replaced by a blinding glare which hurled them backward into the corridor, their power guns firing wildly.

Dead, mangled and dying, the party of Uchke were no longer a menace. Professor Jameson had gained the respite which 744U-21 had foretold. The remainder of the Zorome's fatalistic expectations seemed likely to be borne out, for the sounds of an organized attack

were heard far down the corridor, becoming louder as the enemy approached. The professor now took advantage of the turmoil's cessation to refasten the loosened head of 6N-24 and to replace the decapitated brain-case of 6W-438.

Several Plekne, slaves of the Uchke, burst into view, power guns held firmly, yet uncertainly. Fright lay mirrored on their countenances. Bawled threats from down the corridor urged more of the Plekne to crowd up to the doorway and attack. The professor could easily have killed a dozen, so awkward and backward were the Plekne in their handling of the weapons. It was clear to the mind of the professor that these slaves had been urged on by their masters with the threat of death hanging in the balance.

Fear makes poor soldiers, and the Plekne were no exception to this universal rule. As the machine-man raised his three weapons menacingly, the Plekne darted aside and out of sight. Only one did not retreat. With a resigned expression of hopelessness, as if his act made little difference to him, he stood his ground and prepared to fire.

It was evident to the professor that, through fear of an uprising, the Uchke had neglected to teach their slaves the proficient use of the power guns. The slow and awkward manner, in which these reluctant minions of the Uchke handled the weapons, spoke much to the practiced eye of the machine man.

The power charge intended for the professor went wide of its mark, striking down the metal head and torso of 56F-450. Over he fell like a spinning nine pin, stunned and unconscious. The Pleknan prepared to unloose another charge at the machine man.

"Stop!" Professor Jameson commanded. "Do not fire!"

The mental order was given with such force and startling directness that the Pleknan became confused and inactive, the force of the concentrated thought temporarily halting his intent. Growls and grumbled threats broke forth from the cowardly Uchke farther down the corridor as they urged back those of the Plekne who had retreated so discreetly. Professor Jameson seized the temporary advantage offered him. "We men of metal are friends from your kelp cities! We shall help you escape if you will join us!"

CHAPTER IV

PLAINLY, in clear mental pictures, Professor Jameson impressed upon their minds the relationship which had grown up between Zorome and Plekne. The slaves in the corridor gathered silently around their companion who had knocked over one of the metal men, yet had not been fired upon in return. They stared at the triple armed machine man, assimilating his ideas, both surprised and impressed.

Screams of rage and shrieked orders were hurled by the Uchke from their places of protection at their slaves who had been sent to overwhelm the machine men or else die.

"Join us," the professor suggested, having waited for his first impressions to clarify themselves, "and if we escape the Uchke, we shall return to your kelp cities."

A flash of power hurled itself from the obscurity of the corridor beyond the Plekne. Three of the slaves were whisked out of sight, others bowled over and injured. It was an ominous warning. The Plekne must fight for their masters or else die. This was the issue which forced conviction upon the slaves of the inner world. To the surprise of the Uchke, who had not been the recipients of Professor Jameson's telepathic communication, their armed slaves hurried into the cell of the six machine men.

Certain that the machine men had been overcome, though in what manner the Uchke failed to stop and reason why, they fairly fell over one another in their haste to reach the prison cell and reclaim the thinking machines which they had found only stunned for a short length of time by the power guns. They hastened, lest the machine men recover too soon. At the doorway, an intense wave of destruction met them full in the face, pouring itself into their ranks, and they never knew what hit them. Under Professor Jameson's leadership, the Plekne had at last turned upon their oppressors.

"Let us get out of here!" one of the Plekne cried. "When they discover what has happened, they will blow us out of here at once!"

"But my comrades, — they cannot move!" the professor deplored. "They have been deprived of their mobile parts!"

"Wait!" exclaimed another of the slaves. "I know where the metal legs and arms are stored! It is not far!"

"Can we win through to them?" the professor asked.

"Yes, but it will not be safe to leave your companions here alone. Part of us must remain."

"It's certain death!" argued another of the Plekne.

"Why can't we carry your companions, if they are not overly heavy?" suggested Klegmo, the Pleknan whom Professor Jameson had previously refused to shoot. "The Uchke possesses more terrible weapons than those which you have seen demonstrated. They will train them on this quarter of the building."

This was agreed upon, and wasting no further time four Plekne lifted 56F-450 and staggered down the corridor with him. Other Plekne brought the remaining machine men, and Professor Jameson crawled along with the rear guard. They hurried to an elevator which Klegmo stated would bring them to the storeroom where the appendages of the Zoromes had been taken. As the elevator dropped downward rapidly, a shudder ran through the building. To their ears came a dull, muffled roar. It was all too significant of what might have happened to them had they remained in the cell near to the spot where Professor Jameson had crashed with the stolen airship.

The Uchke had yet to realize, however, that their troublesome prisoners were still a deeper menace than they had anticipated. When the elevator stopped, there were Uchke to meet it with power guns. These blazed forth silently, taking their toll of Plekne, but the odds were too great, despite the latter's lack of skill in handling the weapons. The three guns of Professor Jameson were largely a deciding factor, and the fight was soon over. A dozen of the Plekne were dead, and it was impossible to move all five machine men.

"Bring the metal legs and arms with all speed that you can muster!" the professor told his allies. "I shall stand guard over my friends."

The Plekne acted with alacrity. The machine men waited nervously as the professor was ready to repel any attacks with the all important first blow. It was at 6W-438's cunning suggestion that he took refuge behind his companions.

"If we are struck, you are still left to fight," counselled 6W-438, "but if you are struck, what can we do?"

THE precaution, though a wise one, was unnecessary, for the Plekne soon burst into view, carrying the metal legs and dragging the tentacles.

"Hurry!" was Klegmo's panted admonition. "We got them without a fight, but we have been discovered by a general alarm, and there's a large force of the Uchke in pursuit of us even now!"

In mingled fear and elation, Professor

Jameson hurriedly equipped 744U-21 with appendages, while the Plekne stood ready to repel the oncoming Uchke, if the chase grew hot. In return, 744U-21 fitted the professor's body with two more legs, so that the machine man now lacked but a single leg and a tentacle. Before they finished the job, it was found that all except 744U-21 were insufficiently equipped, for the appendages of 88ZQ4 lay in the chambers of the air-lock beneath the sea bottom. 88ZQ4 was equipped with two metal legs, while the rest had three each.

The machine men were not quite finished when the Uchke burst into view—not a few of them, but a rapidly gathered multitude. The first thing of which Professor Jameson was aware, was a convulsive shock hurling him back against 6W-438. A dizziness assailed him, and he knew that a chance shot of the enemy had struck him. It had not been a direct hit, and dazedly he felt himself hustled into the elevator by which they had descended to this lower level. As they shot rapidly upward, he collected his senses once more.

"We must spread a general uprising among the Plekne," he heard Klegmo say. "It is our only chance—and theirs, too."

744U-21 consulted with the Plekne, and they discussed the advisabilities of their next move. The machine men listened eagerly to the bits of information, learning much of the inner world and especially of the island of light.

"We can make our best stand right here on the island," Klegmo told him. "There is an arsenal here and a broadcasting system to the mainland. Most important of all is the fact that this island is of great importance to the inner world, and the Uchke will forbear using their most destructive weapons on us to avoid ruin."

"This is a strategic position," was 744U-21's opinion. "First of all, we must take over the arsenal before the Uchke become aware of our plans or have an opportunity to forestall us. Then you can broadcast to the mainland, urging the Plekne to revolt and help us."

"We must kill off those of the Uchke who are on the island," said Klegmo, as emotionless as if he had been one of the metal men himself, "and liberate the Plekne from the prisons here on the island."

Having laid the plans of their defense, the machine men and Plekne hurried to the arsenal. Those of the machine men, who were without their full number of metal legs, locked tentacles for better balance. Few of the enemy were encountered, and these were shot down unceremoniously before they could lift a weapon in defense of themselves.

At the arsenal, Klegmo showed them the long range guns which could be wheeled about from place to place and were light enough for two or three Plekne to carry.

"Why do they have so much armament here in the inner world?" Professor Jameson inquired. "They have no enemies to fight, and the Plekne are kept in subjection."

"Most of this armament is made here and taken to the world of the Uchke, wherever that is," replied Klegmo. "For what reason, we never have known."

"And these guns with the light carriage——"

"They are finely sighted with telescopes and have a power range which will reach to the mainland twelve miles away."

SMALL power guns were discovered in endless quantities, but the Zoromes were especially pleased with the larger weapons of defense, for which as formidable sharpshooters they could count on holding off the circling airships,

keeping them at a fairly safe and respectful distance. The atmosphere between the island of light and the mainland swarmed with these ships of the Uchke. It was plain to the Uchke that all was not well on the island of light, and they were soon to become aware of a rebellion among the slaves instigated by the infernal metal monstrosities they had captured on the sea bottom of the hydrosphere. The airships waited for orders, ready to intercept any ships which left the gleaming island of the air.

But the Zoromes and Plekne were attempting no mad scheme such as that anticipated by the Uchke—at least not while the latter were so firmly and smoothly organized for trouble. Under the direction of Klegmo and 744U-21, the Plekne armed themselves to the teeth and hurried throughout the island of light, taking command of all important points, killing their hated masters by force of numbers, what few of them were left on the island, and releasing a horde of imprisoned Plekne.

Among the cells were found several Uchke who were serving sentences. These were promptly put out of the way or else left in their cells, according to the mood of whichever Pleknan discovered them. Ages of oppression was partially avenged in the space of a short time.

Six machine men and nearly five hundred Plekne soon found themselves in sole possession of the island of light, and the effects of this temporary freedom and power on the Plekne were truly revelational. Confidence and a fighting spirit replaced their previous fatalistic hopelessness and resigned fear. To the last Pleknan, they were ready to fight it out for freedom and escape, though it was apparent that freedom might end in death, while escape represented only a symbol for which to wage their battle.

Under direction of the machine men, the long range guns were hurriedly stationed by eager Plekne at all parts of the island looking down on the surrounding mainland twelve miles away. The island was now a veritable fortress, bristling with armament, yet Klegmo shook his head with a melancholy smile.

"A magnificent effort worth dying for, the greater the Plekne have ever accomplished, yet futile. You do not realize the terrible weapons which are stationed on the mainland and which will be used against us if all else fails to root us from our position.

It was a grim prophecy, a forecast of death's grim sceptre which was to fall wantonly and wastefully. Yet Klegmo was among the most enthusiastic and energetic of the Plekne despite his gloomy outlook. It was Klegmo himself who took charge of the broadcasting. His message was heard by Plekne in all sections of the inner world, bringing hope and desperate resolve to the slaves of the Uchkè, and chagrin to the Uchke themselves. As Klegmo had expected, it was the spark needed to ignite revolt into a billowing flame all over the inner world. The message also revealed the situation to the bewildered Uchke and paved the way for an attack.

The Uchke realized that the island must be captured if the revolt was to end. They concentrated their efforts in this direction, giving little attention to the Plekne rioting all about them on the mainland. The masters had held their slaves in contempt so long that they could not recognize them as fearsome antagonists. But the machine men—that was a different matter, and under the machine men on the island the directed attack of the Plekne could be reckoned as a serious hazard. The Uchke meant to strike swiftly at the crux of the situation.

THEIR neglect of the trouble on the mainland, however, was a mistake

which they realized only too late. While they were engaged in concentrating an air attack on the island of light, the Plekne were carrying on a war of assassination, pillage and destruction. Fired by years of oppression and enervation and the inspiration of Klegmo's urging voice, they were in and out of the buildings of the inner world, sulking, striking down and hampering the Uchke who were organizing for a massed attack upon those who held their island of the air. Carnage and death strode hand in hand, as many Plekne dying as Uchke, for the latter were trained, while the efforts of the Plekne were more crude and awkward, yet effective.

On the island of light, the defenders waited grimly. Klegmo continued his encouragement to the unorganized mobs of slaves on the mainland, unaware that the Uchke had at last realized the effects of his words on the slaves, and had set up a stabbing roar of static to drown out his instigation. This din of the loud speakers only added to the chaos and confusion on the mainland. To those on the island, bright spurts of fire, which grew and swelled into billowing flames down on the mainland, offered mute evidence that the Plekne were firing the inflammable portions of the Uchke cities.

To the eyes of Professor Jameson, these distant conflagrations appeared as brilliant stars in the gray dusk of an early morning. Dark specks approached from the mainland, ominous and threatening, to join those airships already waiting for the moment of attack. They eventually formed in a great ring, encircling the island of light, looking for an opening. A tumultous bombardment destroyed the island's arsenal, but the action was much too late. The foresight of the Zoromes had occasioned all arms to be removed from this vulnerable spot so familiar to the enemy.

At a mental command from the machine men, who were stationed at various points of observation on different sides of the island, the long range guns sprang into furious action, blowing to pieces the ships of the Uchke one after another. Coordination of thought, the complete mental accord between Plekne and Zorome and unity of purpose were all responsible for the terrible price the uncalculating Uchke paid. More than half the attacking fleet was snuffed into wreckage before the rest could escape from the vicinity of the island. Back to the mainland the remaining ships sizzagged, presenting difficult targets to the inefficiency of the unpracticed Plekne, despite the marvellous accuracy of the mechanism guided by the telescopic sights.

Up from the mainland sprang several tiny dots, speeding towards the island of light at so terrific a speed as to appear only in very indistinct details, so blurred was their rapid passing.

"What are they?" Professor Jameson inquired wonderingly.

"Small fliers whose speed is so great that they are very hard to hit," one of the Plekne explained. "There are not many of these, but they are very quick."

"If they come close enough, we can bring them down."

The speed fliers of the Uchke indeed represented elusive targets as they sped like malignant demons about the island of light. They were very small, probably holding no more than two Uchke, and it was the professor's opinion they travelled at a speed better than a thousand miles an hour. They came very close to the island, yet they unloosed no attack. Many shots were taken at them, and finally one of them, less careful to fly in a wavy line, was blasted out of the air.

"What are they up to?" queried 744U-21.

"It is hard to tell," said the professor.

KLEGMO, too, admitted his ignorance of this manuever, but the question was soon answered by the Uchke themselves. A blue effulgence sprang forth quite suddenly from the rear of one of the speeding fliers. The indigo cloud spread rapidly, yet seemed to lose none of its intensity, unfathomable and seemingly opaque. Similar sprouts of azure mist sprang from the tails of the other fliers as they hurtled past the island, and soon the blue clouds merged, the distant landscape of the surrounding mainland disappearing from sight. To Professor Jameson, it seemed like staring upward into the deep vault of a clear October sky, such as he had once known on earth. In this case, however, the sky seemed to have been thrust alarmingly close.

"It's a screen!" 744U-21 exclaimed. "Their ships will be invisible behind it!"

Though the situation was indeed menacing, Professor Jameson felt rather a contempt for the weapons of the Uchke, so antiquated and inferior were they to the ones used by the machine men. To himself, he visualized what quick work the space ship from Zor might make of this inner world were it there. But it was not, and the six machine men and their allies from the kelp cities were in a desperate position.

"Each one ready at his gun!" warned 6W-438 from the other side of the island. "The Uchke will have difficulty penetrating this veil and must reduce their speed! Get them before they land!"

But one and all of the defenders knew that the enemy had scored a decisive advantage, and that bringing down the ships before they landed would be difficult indeed.

"Keep your side-arms ready," was Professor Jameson's ominious reminder. "If we fail to bring down the ships before they land, we shall have hand-to-hand fighting."

"They're more than our equal at that," deplored Klegmo. "The Uchke, as many a disobedient Kleknan has learned but once, are proficient with their power guns."

Zoromes and Plekne settled down for a grim, nervous wait, staring watchfully into the blue translucence, ready for the first fighting ships of the Uchke. Professor Jameson found this monotonous, for several times his imagination caused him to visualize from the corners of his eyes a descending ship of the Uchke, which on closer scrutiny proved to be only one of the taller towers of the island, silent and unmoving.

And then came the mental alarm of 56F-450 who was stationed on the other side of the island. One of the raiding ships had come though the misty veil before the guns could be brought into action. Its occupants were already pouring out of the ship ready for battle. The professor listened to the grim recital, heard of the valiant stand. Plekne were being mowed down by the power guns.

A blurred shape, becoming, more distinct, appeared through the cloud and was followed by a companion. Professor Jameson saw the ships coming, and his attention diverted itself from the encounter on the island's antipode to the situation at hand. He swung the large gun up on the farther ship and released the power charge. With satisfaction, he saw the ship explode and the remnants of craft and inmates shower upon the island.

Meanwhile, the first ship had landed, and now a yelling, growling horde of the inner world dwellers came running over the rooftops, power guns held ready. Leaving one of the Plekne in charge of the long range gun, Professor Jameson selected the rest of his gun crew and stole softly into the shadow of a nearby dome. On came the Uchke, a bit uncertainly, yet none the less resolved to wipe out all Plekne and machine men who came their way.

Professor Jameson crept around the dome to come up behind them when they passed by, warning his faithful Plekne to hold their fire until the enemy passed the dome. Noiselessly, he crept around the super-structure, catching a fleeting glimpse of the last Uchke. And then the waiting Plekne let go a withering fire which at such close range required no marksmanship. Few of the Uchke guns were fired, so surprising had been the attack. But the surprise was short lived.

From behind the Uchke there leaped into the midst of the enemy a terrifying creation of metal, tentacles swinging, crushing and choking. Rapidly, the professor finished the work which the Plekne had begun. The cruel Uchke soon lay exterminated, strung in bloody, riotous confusion upon the roof.

"There—that is done!" the professor exclaimed, finding on account that he had lost but two of his allies in the bitter assault. "Now—back to the gun!"

At that moment, a dazzling streak leaped upward from the gun position where the lone Pleknan held forth. A crashing explosion in the blue mist announced the destruction of another prowler. The survivors of the recent fray hurried to escape the shower of wreckage which followed. Another glaring white streak brought forth no sound, and the professor realized that an Uchke ship had figured discretion the better part of valor and had beaten a hasty retreat on witnessing the vicious cannonading of its sister ship.

Into the gun room bounded the machine man on his three metal legs and an improvised cane he had seized from the strewed wreckage of an airship and which he gripped securely in a tentacle. He was followed by his flesh-and-blood cohorts, recently the enslaved victims of the heartless creatures they were now combatting. At the hands of the Plekne, death had just reaped a plentiful harvest, but the grim reaper was no player of favorites, the professor knew well, and he recollected the prophecy of Klegmo.

The Uchke, eager to save their island from needless destruction, were keeping their most potent weapons in check. There was but one outcome to which Plekne and machine men might look forward. The Uchke would wipe them out by slow and steady extermination, even at a terrific cost to their own numbers. They might even cast caution to the winds and in desperation become regardless of the consequences to their island of light. Then would be loosed down upon the heads of the defenders the terrible weapons of which Klegmo had spoken.

"The blue mist is lifting," said a Pleknan. "That is why those last airships were seen so easily."

"It seems to be slowly disappearing," the professor observed.

THIS was true. The azure veil spread by the hurtling speed fliers of the inner world was dissipating itself. Soon, parts of the distant mainland became visible. Reports coming from the other machine men informed the professor that the loss of their own numbers had been comparatively small, while the recent effort of the enemy had cost them many ships. Several had landed, but the entrenched defenders had held the advantage, and under the able direction of their metal allies, they had wielded it for the best results obtainable.

No more attacks were reported during the time the blue mist was in the process of dissolution, and it was evident that the Uchke were waiting—preparng a new type of offensive. The more was soon appparent.

As the last of the azure fog dimmed away into the atmosphere, a terrific shock rumbled through the island. There followed a dull rumble like thunder. Immediately afterward, a jarring concussion

blew into fragments a building a short distance from the position which the professor and his Plekne had taken. A rapid exchange of the telepathic opinions soon convinced the six Zoromes that the Uchke on the mainland now had their various positions pretty well charted, and were sacrificing a small part of the island's architecture in order to blast them out.

"The best thing we can do," Professor Jameson suggested, "is to move our armament to safer positions, leave a few guards to watch for attacking airships, and get as near the center of this island as possible until the Uchke think they have the upper hand. When they quit firing, we can come out, man the guns and blow them out of the sky again."

"Revenge is sweet," Klegmo told them, "but it means only a postponement of our rendezvous with death. Our numbers are dwindling—the Uchke are many—and, eventually, even the metal men must suffer destruction."

It was a potent prophecy, and all well realized the validity of its foundation. The Plekne were ready to sell their lives only at the most expensive price they could exact from their conquerors, while the machine--men never gave up as long as the brain continued functioning in its metalic protecting case.

The warning of Klegmo was well borne out to the effect that the machine-men were not entirely invincible by the weapons of the Uchke. The disheartening report that the machine-men now numbered but five reached the professor from 744U-21. In one of the explosions which had scored a direct hit, 88ZQ4 had met his death. The entire gun-nest had been blown to oblivion. The only traces left were a few scattered metal parts of the Zorome. Formerly Brlx the Triped, 88ZQ4 had known but a comparatively short career as a machine-man.

Leaving but a few Plekne at various points ready to warn of an air attack from the mainland, the remaining Plekne and the machine-men burrowed deep into the central chambers of the island's interior. Outside, building after building, in which the defenders had recently held forth, was demolished as the Uchke set to work, blasting out their troublesome prisoners. The jarring shocks were felt to the very center of the island, yet the machine-men and Plekne were temporarily safe from the bombardment. As Klegmo had assured them, the Uchke would spare their precious island of light as much as possible.

From intermittent reports of the Plekne guards situated in the comparatively safe and obscure observation points of the island's surface, the defenders learned that many of the great sun-lamps had been shot out and that half the mainland now lay in darkness. It was also reported that the rioting Plekne on the mainland had been subdued, having been slaughtered or else chased into hiding. Their hampering influence had previously been a great help to those on the island. Now, however, the Uchke were free to concentrate their efforts on the island itself. Zoromes and Plekne enjoyed a respite during the bombardment. Though the machine men were tireless, the Plekne were not, and they sadly needed the rest which they now obtained for the first time since hostilities had commenced.

The periodic shaking of the island under the bombardment of the Uchke became lessened, and word from the surface notified those in the island's center that the firing was now becoming limited and airships were seen taking off from the mainland. During the intense firing, it had been impossible for ships to approach the island and land safely, and this fact had been appreciated by machine-men and Plekne.

As they hurried to the surface of the

island once again, a strange sight lay revealed before their eyes. Gloom rested over fully half the mainland like grim, black pits of darkness, where the dead sun-lamps had once made the inner world light as day. There had been a method, however, in the gunnery of the Uchke. The brilliant sun-lamps had not been extinguished through inaccurate sighting, but to reduce the glare from the island and make far clearer observation of the defenders' positions.

The machine-men and their allies found that the island, through the extreme care of the Uchke to blow up only their recent strongholds, had really suffered but little damage. The idea of the professor, to remove their armament to new spots, had been a prudent one. Airships were on their way, but this time they were cautious—the main contingent hung well beyond effective firing range, while only a few ships circled warily in toward the island. The Uchke believed they had practically annihilated their enemies, yet none were too eager to assume the risk of finding it out.

And it was well for them that they exercised such caution. Seeing they could not inveigle the ships to come close by holding their fire, the defenders let loose at the scout ships which drifted a bit hesitantly in the direction of the island for a safety inspection. A few scout ships were blown to pieces, the remainder of the fleet which had waited patiently scattering in all directions to the mainland.

It was Professor Jameson's opinion that the concentrated destruction, which was hurled simultaneously from every gun on the island after the fleeting airships must surely have dismayed the hopeful Uchke. He looked for a new maneuver on the part of the dwellers of the inner world.

"Hell will break loose now!" was the equivalent of Klegmo's statement.

And hell did break loose, though in no bombastic manner such as the machine-men had been expecting, not as a terrific display of power sufficient to rend the island into several separate chunks. Quite to the contrary, death made its advent in a silent, sure, sinister manner.

CHAPTER V

PALE, yellow rays stabbed upward from the mainland in thin pencils of light, clearly distinguishable in those portions of the inner world which were plunged into darkness. Like phantoms, the yellow light flickered slowly, searchingly, about the island, as if feeling for something that was hidden. Several of these lights were being employed by the Uchke from various sections of the mainland.

"What are they?" queried Professor Jameson to Klegmo who was not far distant.

"Death rays!"

"Do they burn?"

"No—they disintegrate!"

Across twelve miles of atmosphere, the thin pencils of light pierced their way, wandering and exploring for the defenders of the island stronghold. Klegmo, having appraised the machine men as to the rays' terrible qualities, urged them to radiate orders for a general scattering of the Plekne all over the island.

"It is the end!" he lamented. "Yet we must not die like the low creatures which the Uchke believe us to be!"

"The ray ejectors can be blasted out with the long range power guns," 744U-21 suggested. "Up until now, we have not fired at the mainland."

"It is too far," replied Klegmo, "but we can try."

"The targets are stationary, quite unlike the air ships," was Professor Jameson's contribution to the council of war.

"Careful sighting and continual firing may bring results."

"That will reveal our positions," countered another Plekman, "and our only chances are evasion of the ray."

"Why not hide in the center of the island again?"

"The rays penetrate clear through the island," was the despairing cry. "The range has been set for that."

One of the gun nests, acting on previous suggestions to pick off the ray ejectors, shot streak after streak silently down upon the mainland. The reports reached the island faintly. Almost immediately, the nearest ray swerved in the direction of the offending weapon. Out of the place hurried the Plekne, fleeing in terror from the grim, inexorable ray. Several escaped, yet the ray overtook three of them. Professor Jameson looked on in mystification as he saw parts of the terrified Plekne disappear, saw them fall and completely vanish. Having finished its terrible work, the yellow ray wandered away in search of more victims.

"Why did the Uchke fail to use these rays before this?" 6W-438 queried from his outpost on the antipode of the island. "It is their least destructive and most effective weapon."

"Wait—and you will see what it does to the island of light," promised Klegmo. "Watch the buildings. The effects on them are much slower. Soon, where the yellow ray has touched them, they will crumble to ruin. I once saw the ray demonstrated."

"So that is why they kept this in reserve."

General orders were given to scatter and watch for the rays to come. When they came, they must be eluded. Sustained life belonged to the fleetest and most observant. The long-range guns were to be sighted and fired from time to time and then abandoned when the ray came to search them out and destroy.

Professor Jameson's opinions came to reflect the fatalistic attitude of Klegmo. Plekne and Zoromes, they were all marked by the stigma of death. The cruel ray would eventually discover them all, or enough of them to render defense of the island an impossibility. Once more the professor saw the yellow ray sweep unwittingly over the hidden retreat of several Plekne. Their dying screams rang dismally upon the air as they stumbled forth, one of them with an arm cut away neatly by the devastating ray. The ray flitted after the armless one who ran, overtaking and finishing the work which his flight had interrupted. The ray then returned to complete its gruesome work on the struggling remains of those who had been unable to run. It reminded the professor quite forcibly of an ant-hill and a small boy with a burning glass. The scene was grim with evil forebodings.

And now Professor Jameson saw why the Uchke had reserved this ghastly weapon until after other means of subjection had failed. With a dull roar and crumbling of dust, several of the nearby buildings sank into ruin. All over the island, similar scenes were being enacted. Those of the Plekne, who had yet eluded the yellow ray, were endangered by the slow destruction of the buildings in which they hid. Upon the professor's mind suddenly rang a cry of distress. It was 56F-450, nearest of Professor Jameson's mental companions.

"21MM392—I am pinned beneath the ruins!"

"Are you damaged badly?" the professor asked in apprehension.

"I believe not—fortunately. But my poor Plekne friends are beyond all help, I fear."

Without further query, Professor Jameson acted on a bold, impulsive gesture. Across from him, quite a distance away over the smooth roof lay the ruined

spire in which the machine men were imprisoned. The professor abandoned caution. Why gamble with the fates any longer? If their doom was irrevocably sealed, would furtive dalliance avail them anything?

Rapidly he bounded over the roof, making good us of the metal stanchion he used as a crutch. A yellow ray flickered eagerly to meet him. Back on the mainland, an evil face lit with cruel glee and anticipation, as a watchful eye glued to a telescope saw what it had hoped to find—one of the machine men. Professor Jameson saw the dread light approach him, yet he made no effort to dodge out of sight. In fact, such an attempt would have been too late. The yellow light raced quickly for him, then slowed up as its watching controller saw that the metal man was making no vain effort to escape. The yellow light engulfed the professor quite suddenly, following him in his rapid flight.

MUCH to his surprise, the machine man felt no visible change. Was he immune? Then an idea struck him. Like the buildings about him, a longer time was required to effect the change. Into the ruins the doomed machine man raced, the yellow light hanging grimly on his trail, like the ghastly beam of perdition. 56F-450 was securely pinioned beneath two metal beams. With a mighty effort of combined strength the two machine men lifted the encumbering obstacles, and 56F-450 climbed to freedom.

"The ray!" he exclaimed. "It has us!"

Professor Jameson nodded, a habit of assent or agreement which the Zoromes had noted was peculiar to him.

"We are not dead!" was 56F-450's surprised ejaculation.

"No," said the professor, "it seems to be only a question of time."

"You mean we have but a short time in which to live?"

"That is just what I mean."

"What of our brains?" queried 56F-450. "Why is it they do not disintegrate like those of our friends the Plekne?"

"For the same reason, 56F-450, my own brain did not depart from its metal body in the transition cube of the Tripeds. Our metal brain cases appear to be immune to penetration."

"Then, like the surrounding buildings," mused 56F-450, "we can only wait for our heads and bodies to disintegrate."

"If we are to die, we'll die fighting!" the professor swore vehemently. "We may, in a measure, wreak vengeance on these Uchke! Yonder is an empty airship! Let's be off!"

They ran to the ship as fast as their inadequate number of metal legs would permit, the yellow ray tagging them persistently. It settled down over the airship, and then they were off into the air, Professor Jameson at the controls.

"Now that the ray has played upon the airship, that, too, will soon fall apart," opined 56F-540.

"We shall probably be dead before that," was the professor's practical, yet cheerless, answer.

Like a veritable demon, the ship sprang screaming for the mainland at a terrific pace. A loud explosion behind them rocked the craft. The professor turned from the controls. A ragged tear had been inflicted in the rear of the ship.

"The power guns! They're trying to get us before we can accomplish anything!"

Professor Jameson veered upward once again to be halfway between the island of light and the mainland. Sweeping around the island in a wide circle at the fastest speed the craft could maintain, the machine man raced against his worst enemies, time and death. The weapons of the ship were directed at the main-

land, and the professor barraged the inner world with all the destructive forces and power projectiles the ship possessed, 56F-450 assured him that his efforts bore fruit, watching the distant terrain six miles below them for the effects of the destructive explosions. The ship's offensive charges soon became exhausted and useless.

"What now?" asked 56F-450. "Death still awaits us!"

"Do you feel any difference in yourself yet?" queried Professor Jameson.

"No!"

"We have time then to take up another ship," said the professor, heading for the island once more.

On the island of light, fully one-quarter of the buildings were laid in ruins from the effects of the terrible yellow ray, and more of the sun-lamps of the inner world were extinguished. Professor Jameson landed close by another deserted ship which had been left upon the island during the hand-to-hand fighting under the azure mist.

"What are you doing, 21MM392?" came the silent voice of 6W-438 from near by.

"Doing all we can before we die," was the professor's desperate reply. "The yellow ray has marked us."

"Do not fear it," came 6W-438's startling announcement. "We are invincible against its powers—that I have recently discovered, as have 744U-21 and 6N-24."

"But the buildings here even crumble beneath it," the professor pointed out.

"Only those parts of the building which are made of rocky substance," corrected 6W-438. "See the metal parts strewn all about. They are entirely intact, though they collapsed with the rest of the building."

With intense relief, the two machine men heard the evidence of their salvation, but contemplation of it was short lived. A terrific explosion blew the airship before them into ragged wreckage, hurling them backward.

"We're not invincible against that, if it hits us!" the professor exclaimed, as the two machine men picked themselves up and ran to join 6W-438.

"Nor against those, either, if they get close enough," said 6W-438 waving a tentacle skyward to the swarm of airships which were heading for the island.

"Where is our defense?" cried 56F-450. "Why don't they fire?"

As if in answer, a few scattered bursts issued from the island.

"We are practically wiped out," was 6W-438's reply. "There are five of us left and no more than a dozen of the Plekne."

In the obscurely lit sky, the horde of angry ships grew from tiny pin points to large dots. Their coming was only too significant. The Uchke had all but wrecked their precious island of light in order to conquer the rebellious slaves and the formidable machine men who represented the nucleus of the trouble.

"What is that?" queried 6W-438 suddenly, pointing off toward the main land.

The three Zoromes stared at a thin shaft of silver, that shot upward from the mainland for nearly a mile or more. A cascade of tiny points were being ejected at the termination of the shaft, falling back and disappearing on the mainland.

"Another weapon of the Uchke," ventured 56F-450.

"If that is so, we are safely beyond its reach," said the professor. It barely leaves the mainland."

"But it is growing larger," said 6W-438. See how it is reaching out for us. The shaft is growing thicker, too."

In truth, the curious silvery stream had really assumed larger proportions, yet its termination was less than a quarter of the distance from the mainland.

"That is no weapon!" Professor Jame-

son exclaimed with sudden realization. "It is water!"

"Water?"

"From the surrounding hydrosphere!"

"Do you suppose it is another trick of the Uchke?"

"I do not understand it," came the mental call of 744U-21. "From my position, three water spots are visible."

"That makes four!"

"Look—the airships!"

6W-438 pointed skyward. The oncoming airships had slowed their speed and had momentarily wavered from their deadly intent. Several of them wheeled and headed for various sections of the mainland. The rest of them hesitated several minutes while the machine men and handful of Plekne waited nervously for the next move.

"The Uchke are not responsible for this," stated Professor Jameson. "The ocean has broken its bonds and has spread fear among them."

"If the sea had only interferred earlier," 744U-21 lamented from the opposite end of the island. "It might have saved us."

"Where is Klegmo?"

"Dead!" came the gloomy announcement of 6N-24. "The last explosion got him!"

The armada of Uchke aircraft once more turned to its grimly appointed task despite the fact that the mighty hydrosphere was pouring millions of tons of water into the inner world of the planet's core. Far away in the distance, just above the mainland, came dazzling bright flashes which puzzled the machine men. A good share of the ships had been turned back in that direction. The remainder of the fleet rapidly neared the island.

It was the professor's belief that the ships returning to the mainland had been called back in a desperate attempt to repair the leaks. How had four different leaks occurred almost simultaneously? The bright flashes which the machine men had seen down over the mainland were growing larger and coming nearer. They were unlike the power discharges of the Uchke weapons. Professor Jameson realized, however, that there was little time to ponder the strange occurrences, and the urgent admonition of 744U-21 was superfluous.

"Find cover! It is our last chance! If we can hold them off until the water rises——"

The vengeful ships of the Uchke, meeting with feeble opposition, were now so close that Professor Jameson knew 744-U-21's advice to be little more than a desperate gesture. With 56F-450 and 6W-438, he found concealment, yet from a position where they all might watch.

Then came the bombardment. The air roared and trembled around them. The entire island quivered and bellowed to the terrible concussions which shook it. For a time, the professor wondered vaguely if the staggering blasts might not throw the island of light out of balance of attraction and send it hurtling like a moon of doom down upon the mainland. Like angry wasps, the ships of the Uchke raced madly over the island, circling it constantly, letting their terrific barrages of concentrated destruction fall haphazardly. Whole buildings were cast high into the air, then rent to infinitesmal debris by the Uchke destroyers. No longer were the Uchke working to save the island of light. Their entire colony of the inner world was doomed.

Frantically, they sought to wipe out the metal men ere they must flee the churning waters which roared through the ruptured air-locks.

Since his escape from the raging volcano on the planet of the double sun, Professor Jameson had never known such chaos, such din. The island rocked, staggered and swayed, threatening to lose its balance of suspended equilibrium. Sev-

eral terrible concussions threw the machine men from their feet, so close had death swung its gleaming sickle.

They were doomed. Each and every machine man was aware of this, yet they clung tenaciously to life, clung firmly to the vain possibility that the explosions would miss them, conscious that while their metal heads still existed there remained a spark of hope. But the wrath of the Uchke knew no limitations. They slowed their mad speed for a final salvo to comb the regions of the island yet untouched. Their extermination of the island's defenders was about to be completed. Professor Jameson realized this quite significantly.

No use was there of fleeing to the island's center. The inner chambers were buried beneath tons of exploded debris, choked up and partially filled. The surviving Plekne, who had fled there in terror from the unloosed hell of the Uchke, now lay crushed beneath the ruins or else trapped in a living death, buried alive. Miraculously, all five Zoromes had survived the sweeping fire of the Uchke, but now, as the ships circled lower, Professor Jameson knew that the hour of the machine men was nigh.

He stared beyond the flickering shadows of death's grim harbingers preparing for their last attack before quitting their doomed inner world. The silver shafts of water now reached not so far into the air but were broader. Lakes were forming on the mainland from the rushing, gushing, tumbling rivers of sea water which grew in volume by the minute. Soon, the professor knew, these lakes would merge, and there would be an endless, inland, upcurved sea, rising ever higher until the inner world represented a globe of water surrounded by its thick shell, the hydrosphere's sea bottom.

A roaring filled the professor's auditory senses, and he felt himself cast on high. Thick was the dust about him. He crashed downward, still sensible, and, as the dust cleared, he saw that the concealing roof above him had been blown completely away with half the building. Not far from the professor, partially covered by wreckage, lay 56F-450 and 6W-438. Darkness, except for the lights on the mainland and those directed from the aircraft, reigned in the inner world. The remaining sun-lamps had been shot to pieces.

The light from a ship soaring into view above them flickered forward toward the three metal bodies—Professor Jameson groaned inwardly, knowing what it portended. A dazzling flash, dimming into insignificance the glow from the Uchke airship, suddenly revealed to the professor the forms of his metal companions digging deeper in under the debris to be out of sight. They still lived. He was glad.

Again came a silent, dazzling flash high above them, and the marauding ship of the Uchke disappeared. Realization suddenly came to the professor, and the sudden knowledge overwhelmed him with intoxicating joy. And if the bright flashes, now occurring everywhere, were not sufficiently significant of the state of affairs, a telegraphic cry came down which certainly credited Professor Jameson's senses with having guessed rightly.

"Zoromes—do you still live?"

Five hearty responses assured 38R-497 that his call had not been a vain summons to the dead, which he had more than half expected and had feared.

"Lay low until danger has been cleared."

The machine men of Zor had come through the hydrosphere to the rescue of their lost companions. But of the details, and by what manner the machine men had learned of the inner world and had known that the lost Zoromes were there, the professor knew he must learn

later. In the bright, flaring flashes which lit the sky from time to time, Professor Jameson saw that the machine men had set up and utilized the little scout cruisers of space. How they had been brought into the inner world he could only conjecture.

The Uchke were being shot from the sky rapidly by the invincible ships of Zor, and the five Zoromes on the island of light knew that it was only a question of time when the menace of the Uchke would be removed. No more shots were fired at the island. The dwellers of the inner world were having their hands full in a futile effort at defense against the machine men.

THE death of 88ZQ4 was avenged a thousand-fold many times over. The intermittent flashes of the Uchke ships as they were sent to oblivion revealed from time to time the contours of the mainland. First, the professor saw that the water had submerged all but the higher promontories; later; only a few of the tallest buildings thrust their tops above the churning, tumbling waters; then, they were finally gone beneath the surface. Only a vast, restless expanse of water lay on every side, and slowly it diminished the distance of the island.

Scout ships from Zor came and rescued the five survivors. From the ruins of a building there issued a limping figure supporting another in his arms. A Pleknan with a wounded comrade, the sole survivors of more than five hundred slaves who had battled side by side with their six metal allies, had lived through the final and most terrible attack. The two Plekne were taken aboard one of the little ships. To the surprise of Professor Jameson, he found it piloted by Ogweg, the truculent Pleknan who had dared cast a futile attack at the might of the Uchke.

The Uchke had all disappeared, as the machine men discovered on searching about with their giant lights. Floating on bits of wreckage, some of them swimming in the calmer waters far from the bubbling undercurents marking the hydrosphere's ingress, were many of the Plekne who had rioted on the mainland. Excellent swimmers, they were rescued by the machine men from the watery graves they were so desperately battling.

The irresistible waters were pouring in faster, having dug deeper channels by the force of outer pressure. Soon, only a thin layer of air insulated the island of light from the waters of the conquering hydrosphere. Professor Jameson watched in the brilliance of the ship's glow as the air surrounding the island suddenly clustered into several gigantic bubbles and sped for one of the openings leading from the core of the hydrosphere. Where once there had been a colony of the Uchke, there was now only a mammoth cavern of the hydrosphere's center into which the sea rolled unobstructed. The ruined island of uight now lay in a watery grave.

No longer would the Plekne have cause to fear the menace from down under the kelp cities. It was in the professor's mind to see that the Plekne of the hydrosphere no longer had to fear the cruel Uchke at all.

The scout ships of Zor, built strong to resist the undersea pressure, filed out through one of the great channels of the hydrosphere's core. On the way to the surface, Professor Jameson learned from 29G-75 how the machine men of Zor had come into the hydrosphere in search of the six lost machine men.

"When the Uchke raider fired on you, as you returned from the kelp city, we thought you were dead. Then came the story of the Nacac and of the futile attempt to rescue you—how a great fish had swallowed you and 88ZQ4.

"We made plans to search the center of the hydrosphere. The scout ships were

taken from the mother ship and assembled for undersea penetration. We searched far and wide on the bottom of the sea, realizing that if two of you had survived the Uchke shot, the other four possessed equal chances. By all means, even had the Nacac not brought us the story they did, we should have searched for our six lost companions to discover their fate. Several of the Uchke craft attacked us, and in this way we discovered one of their air-locks, destroying all but one of their submarines which we pursued to its lair."

"Who unloosed the waters into the inner world?" asked the professor.

"We did," was 29G75's prompt reply. "The air-lock was guarded against our entrance, and depth charges were released in an effort to drive us off or destroy us. Before anything definite could be decided upon, Ogweg took matters into his own hands. He blew the air-lock to bits, realizing that inside the core of the planet were the Plekne's hated oppressors. While we entered, he searched the ocean bottom for more of the smooth platforms marking entrance to the inner world. He found and destroyed three more before tiring of the sport. Then he joined us. The currents of water were fast and strong, dragging us through the channel at a rapid pace, hurling us far out into the atmosphere of the inner world. We were immensely surprised, not having looked for a rendezvous beneath the sea to be constructed of such a large order.

"We were confused as to the situation. Though we believed you to be inside the core somewhere, not having found you on the carefully scoured sea bottom by telephatic call, we landed and captured several Uchke, forcing them to tell us where you were and why so much fighting was being carried on. It was easy. We read their throughts before they even guessed our intent. Among other facts, we discovered that this planet's core is not their home. 21MM392, do you know whence they come?"

"I do not know for certain," was the professor's reply, "but I can guess pretty well."

"And what is your guess?"

"The planet we passed on our way to the hydrosphere. Remember the strange ships that attacked us?"

"Your guess is correct," said 29G-75. "The Uchke used this inner world only as a slave-base and manufacturing plant. It seems that long ago they hollowed out this world by disintegrating the rock."

"29G-75, we must see that the Uchke never menace the Plekne again. Some day, the Uchke may return. We must go to this planet of the Uchke and render them harmless. Then only can we leave this planetary system and head back in the direction of Zor."

"21MM392, are you aware of what system of worlds we shall pass in this direction?"

"I have not consulted the charts lately," said the professor. "Why do you ask?"

"Because you may be interested to know that our route back to Zor will take us close to your planet Earth, where we found your dead body encased in its rocket satellite."

As Professor Jameson pondered this revelation, the little scout ship bobbed into the light of day, gently riding the surface of the hydrosphere. Upon the horizon lay the faint outlines of a distant kelp city, lined resplendently against the red sunlight of the dying day.

THE END

The Supermen

By DAVID M. SPEAKER

In this story we are told of the "War of the Supermen." It is pictured as a menacing invasion. The story goes on in journal fashion, or rather like a diary, to give us an intermittent presentation of what is called the "terrific crisis." We know that our readers will greatly enjoy this tale.

Illustrated by MOREY

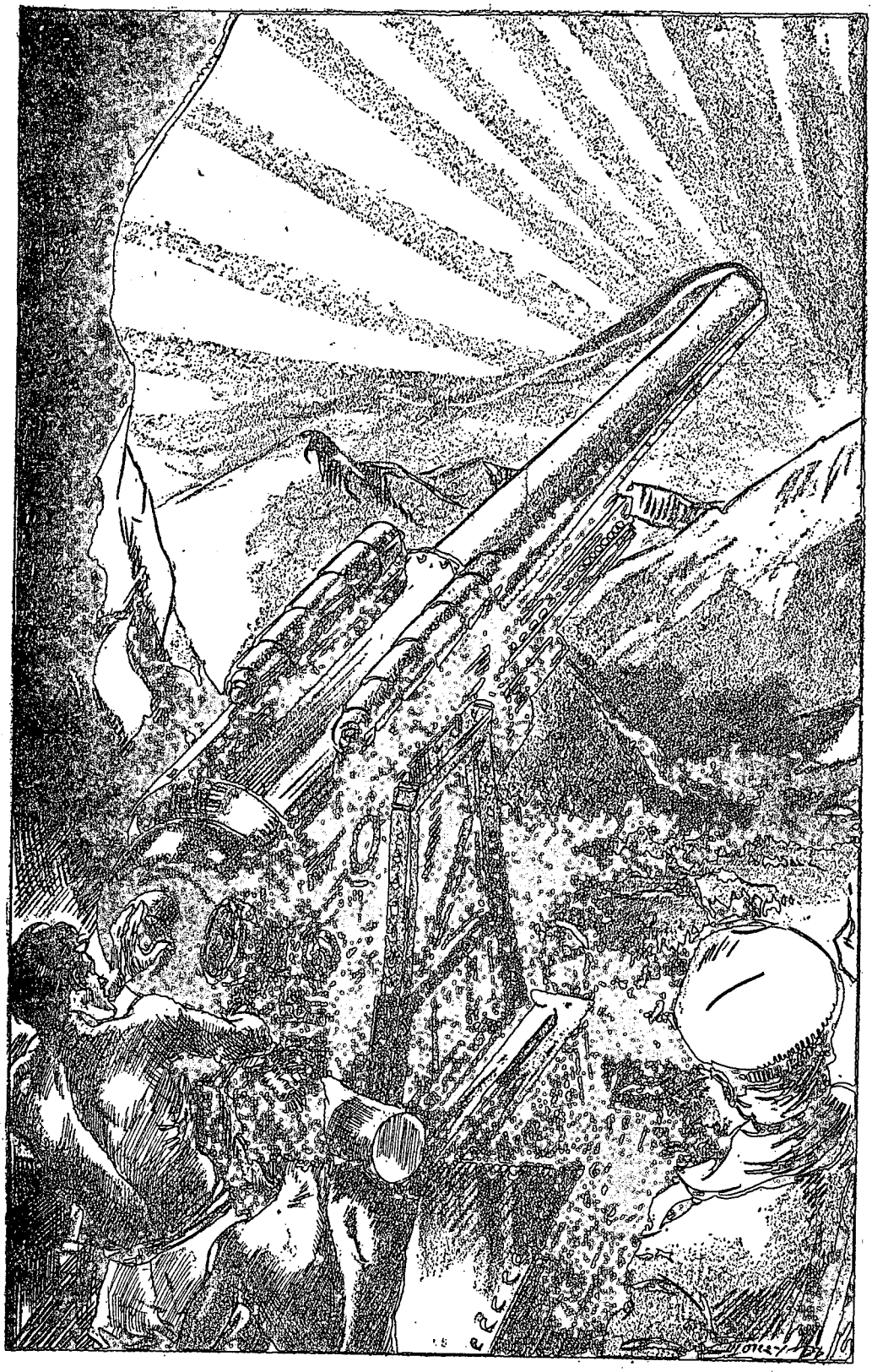
ALTHOUGH the War of the Supermen has been ended for more than five years, this is the first occasion that a complete history of that terrific crisis, together with the circumstances leading up to it, has been placed before the public.

Perhaps one of the most peculiar features of the War was its extraordinarily brief duration. From the beginning to the end it occupied a period of barely three months. But those few months represented the most hectic period in the history of civilized man, and, had it not been for the brilliant genius of Professor Carl von Renstein, it would have ended with the displacement of *genus homo* from the position of the earth's dominant race.

THE first of the Supermen made his initial public appearance on November 9, 1961, late in the afternoon. Vividly silhouetted against the setting sun, he was seen, at the edge of a field in Western Pennsylvania, by a farm hand who was returning home from work. According to his story, the figure hailed him, and, as he stood still, advanced to meet him. It resembled a man of about forty with a clear complexion and black eyes, which shone with a phosphorescence clearly visible even in the sunlight. In fact, except for this last characteristic, the Superman was outwardly no different from any human being.

"For a while we talked about all kinds of things," said the farm laborer in relating his encounter to a reporter. "And then the uncanny light beaming in his eyes made me feel rather uneasy. I guessed it was just my imagination, though. There was nothing else about him that seemed strange. He wore a hat and was rather well dressed. But I couldn't think of what he would be doing in such a place. You know the field is quite a distance from the farm house and that is the nearest place where anybody would want to go. I think he said that he was going to meet some one in the village, but that is several miles away and there is the railroad which any sensible person would have used. As the farm house and the village are in the same general direction we started to walk together. For a while we didn't say anything. Then he suddenly stopped. I turned to look at him.

"Did you drop something?" I asked. He didn't answer me but just gazed at me with those eyes of his. I tell you they just *bored* into me like a light searching my soul. It seemed to me that I stood staring at him for five minutes without moving. All at once I felt that he was ordering me to walk backwards. He didn't say anything. He just *thought* it and I had to do what he wanted me to.



The general swore softly to himself.—"Rotten aim! Should have hit the peak. We didn't get them on the first shot and now we are in for it." They were.

Then he commanded me to stop, to walk forwards, to walk to the left, to the right. And all the time he kept looking at me with those shining eyes. It gave me the creeps. After that he made me turn around so I couldn't see his eyes, but it didn't make any difference. And the whole time he didn't say a word to me. All at once it all stopped and I felt as if a weight had been lifted from my brain.

"I turned and found that he was walking slowly away muttering to himself something that sounded like 'It works, it works. We will control them yet.' I didn't know what to make of the whole thing. At first I thought that it was one of those hypnotists practicing. Just then I got scared and started to run away. Once I looked over my shoulder and saw him staring straight at me. I ran faster and didn't stop until I got home. I've never seen him since."

A BRIEF outline of the above narrative appeared in a local newspaper and in two days was completely forgotten.

The second visitation of the Supermen was attended with tragic consequences.

About 11:30 P. M., November 22, almost half of the village referred to above was blown up by a terrific explosion which shook the ground for miles around. The next morning a posse of armed citizens searched high and low for the author of this hideous crime, but without result. No one in the vicinity dreamed of connecting the catastrophe with the advent of the Superman, but subsequent occurrences leave us with little doubt that there was a significant relation between the two.

Near the village was a large steel plant, shut down on account of a strike. Some one passing by a few days after the catastrophe was surprised to notice that the door had been forced open. Investigation proved that a chemical laboratory within the building, designed for analytical purposes, had been completely stripped of its contents. Nothing was left but one or two specimens of a crude iron ore. The inference was obvious. Some one had, with the stolen laboratory supplies, manufactured high explosives and seemed to be conducting a war against mankind. This latter deduction was strengthened on the night of December 3, when a second blast destroyed the other half of the village in the same mysterious manner. Scarcely anyone survived to tell the tale.

THEN the government took a hand. The thing was getting too serious. No one's life was safe any more. The unknown criminal might commit even more horrible deeds if he was not instantly checked in his career. The whole section was placed under military protection. For almost two weeks nothing happened. And then the third manifestation of the Superman and his possible associates took place. It seems that towards evening one of the soldiers was chopping a bit of firewood to replenish the supply. Whistling softly to himself, his ax was rising and falling with monotonous regularity.

WITHOUT warning a slender ray of intense green light suddenly stabbed through the night and apparently pierced the blade of the ax, just as it was poised for a stroke. There was a sharp crackle and a pungent smell filled the air. The beam lasted but a second and ceased as abruptly as it had begun.

By the time the startled soldier recovered from the stupefaction produced by this astounding phenomenon, he found himself surrounded by an excited, gesticulating group of companions, eager to know what had befallen him. For an an-

swer he could only point dumbly to the ax. Inspection revealed that the center of the blade was perforated by a round, clean-cut hole. An officer came running over to learn the cause of the disturbance. His questioning disclosed that the ray originated from the peak of a high mountain, many miles away. The officer, much puzzled by the story, communicated with his superior. Orders were given that an airplane be sent to investigate. The whole staff was watching the progress of the plane by the aid of binoculars, which made clear each detail. Just as the machine passed above the spot in question, the green ray shot vertically upward directly in its path.

THOSE who had been watching say that the pilot made a tremendous effort to steer clear of the deadly beam but could not succeed as it followed him in every direction. Suddenly the ray darted to the roaring engine which was at once illuminated by the fierce green glow. The steel machinery vanished at the contact. The pilot attempted to volplane to the ground, but the diabolic pencil of light traversed the body of the ship once or twice toward the rear, thus effectively cutting the control wires. For a brief instant the airplane hung in the air, during which time the pilot was barely able to save his life by the parachute with which he was equipped. Then, diving with ever increasing velocity, the machine crashed to the ground and went up in flames.

For the first time the soldiers realized that they were dealing with an enemy of unknown powers. But it must be said to their glory that they went to their duties without hesitation or fear.

Immediate steps were then taken to drive the Supermen (for it was now evident that more than one were involved) from their station. Two six-inch guns were ordered and in twenty-four hours arrived at the vicinity of the mountain. At 8 A. M. the following day the first shot was fired, formally opening the War of the Supermen. As the shell approached the mountain peak, the latter became enveloped in a brilliant red glow lighting up the surrounding country. At the moment the missile entered the region of the ruddy light it suddenly stopped in its course, to the amazement of the beholders, actually went backwards for a yard or two, and dropped to the ground. Each time a shell came within close proximity of the mountain the same thing occurred. In the meantime, the devilish green ray commenced to operate again with the result that the two guns met the same end as the airplane engine in spite of the most strenuous efforts on the part of the men to avert it.

THE general, believing that higher power guns might succeed in penetrating the ruddy glow, had two of fourteen-inch caliber brought over which met with exactly the same fate. In a fit of rage he shook his fists in the direction of the mountain and hurled imprecations at its inhabitants with the net result that a few of them appeared and regarded him curiously from behind the red defence screen.

The situation was truly tantalizing. Here was the enemy safely ensconced in the mountain without having made one counter-attack. On the other hand there seemed to be no way of either capturing or exterminating them. There was no possibility of attempting a sudden attack on foot for it was well known that they were in possession of bombs of tremendous power. No airplane could go near them and even fourteen-inch shells were unable to pass through their defence.

Affairs had remained in this neutral state for a week when the Supermen made their first initial attack, since the

government had opened the war. In the morning, while the soldiers were being reviewed, the green ray suddenly appeared and swept the ranks from end to end. No one was injured but all the flashing rifle barrels disappeared in a few seconds as the beam was moved so as to include every bit of visible metal. Medals, rings, wrist-watches—everything of metal met the same fate.

When the world began to realize what was going on, thousands of scientists were anxious to inspect these new and amazing phenomena. Foreign governments offered suggestions, sent men, and did everything they could in an effort to help combat this menace. But all to no purpose. It was now over two and a half months since the first of the Supermen was seen and not a single thing had been accomplished. Meanwhile fresh atrocities were being committed daily. Town after town was being blown up by bombs projected in some mysterious manner, and the green ray swept the sky in search of airplanes.

IT was the genius of Carl von Renstein, a hitherto obscure professor of biology who interested himself in physics as a hobby, that at the last possible minute saved the human race from almost inevitable destruction. He worked out the problem of the red glow employed by the Supermen. To his astonishment he found that they had mastered the secret of universal magnetism and repulsion, so that they were able to operate it on a large scale on any metal, whereas it had been formerly used in a comparatively rudimentary state in connection with iron, cobalt, and nickel, but with no other metals. The mystery of the green ray which produced atomic disintegration in metallic substances remained a mystery, which to the chagrin of the learned savant. However, having discovered the secret of the crimson light which protected the Supermen, he could rest content, satisfied with the knowledge that he had saved mankind from certain doom.

His whole discovery was summed up in a formula which he presented to the government. The exact details of it were unknown, but it was announced that it explained the preparation of a compound that would resist the action of that peculiar agent in service of the Supermen that repulsed the shells.

The formula was put to use the next day. Hundreds of high explosive shells were coated with a kind of paint made of this substance and a score or so of sixteen-inch guns were hastened to the vicinity of the mountain and placed in a semi-circle around it. Carefully camouflaged, they were loaded and aimed at the peak whence had emanated the green ray. When the prearranged moment arrived the first gun was fired, and at the report the red light appeared as before. But this time the shell failed to stop, and hitting the mountain-side, blasted a large hole in the rocky slope.

THE general swore softly to himself. "Dammit! Rotten aim! Should have hit the peak. We didn't get them on the first shot and now we're in for it." They were. Like a striking reptile the green ray leapt from the mountain peak, and attacking the gun, caused it to vanish into thin air. Following it a bomb was discharged from the same place and blew six of the massive guns into fragments. It was fortunate that the genius of von Renstein had foreseen this, when he advised taking several of them. The next shot saved the day. For better aimed, it struck squarely on the center of the peak and hurled the Supermen into eternity.

I will not dwell on the reception accorded to von Renstein at Washington, nor will I dilate upon the Great Inter-

national Treaty of Paris which followed a short time after. All of these facts are now matters of historical interest.

BUT now I come to the hitherto unknown portion of this history. It is a matter of public knowledge that Carl von Renstein died about a year ago leaving behind him, among other things, a will and a diary. In the will was a request that the diary should not be opened until twelve months after his death. Now that the specified time is up, I am acting in accordance with his wishes in printing certain portions that are connected with the Supermen. The manuscript was originally written in German and a rather free translation, *minus* a few somewhat explosive remarks, appears below. Besides clearing up a few details here and there of the above history that may seem somewhat vague and insufficient, it actually solves the mystery that has always surrounded the origin of the Supermen—a mystery with which the greatest living scientists have been powerless to cope.

JANUARY 4, 1960. A fine day. But my work leaves me little time for admiration. My advanced biology class begins work on heredity to-day. And there is that experiment about the speed of the light reflex action of the amoeba as compared with that of the paramecium. Then there is the new parallel beam microscope that just arrived from Germany yesterday, that has to be assembled.

JANUARY 5. The heredity class yesterday was interesting. I explained how the genes, found in the chromosomes of the nuclei of the reproductive cells, influence various hereditary characteristics. I told them of unit characters and of dominant and recessive traits. With the new microscope we could actually see the genes in the germ cells of a rabbit. Just then one of my pupils asked me a curious question. He wanted to know whether one could fix an animal's characteristics beforehand to suit one's self, if he could tamper with the genes and arrange them at will. An interesting thought.

FEBRUARY 26. It is a long time since I have entered anything in this diary. The new incubator came to-day. By the new Austin electrical process perfected last year, we could watch the fertilized egg of a guinea hen grow into a complete and mature individual in the short space of twenty minutes!

JUNE 16. Four or five months ago I used to write in this book every day. Now, for some reason, I don't. Probably because nothing of interest ever happens here.

JULY 10. Vacation at last! Now I can go on with some original work in biology, which I had planned.

JULY 12. There is something that sticks in my mind. It is that question that I was asked about changing the hereditary characteristics by manipulation of the genes. Of course the thing is theoretically possible. But practically, who knows? After all there has recently been developed apparatus undreamed of ten years ago.

JULY 21. I have decided. I am going to devote myself to research on hereditary traits and their artificial alteration. But first I must get one of those excellent parallel beam microscopes. And I need an incubator like the one in the college laboratory.

AUGUST 29. Eureka! Success at last. I have taken the fertilized ovum of a cat and by injecting some of the

genes of a dog I could actually make it bark! Yes, bark! It is wonderful. Such a success I never dreamed of. Yet sometimes I fear that no good can come of this. Such power is more than mortal man should be allowed to possess. Well, now I am going to take a vacation. And then back to college and to work!

SEPTEMBER 27. College has begun. I saw the boy whose chance question put me on the track of my great triumph. I told him of my work. How his face beamed with pleasure and amazement when he heard of it! He suggested that it might be experimented with in man. A terrible idea! What might occur, no one can guess.

The notes inscribed from September 28, 1960 to September 30, 1961 have been omitted as they are of little interest to the layman, being principally scientific reflections having no bearing on the story of the Supermen.

NOVEMBER 1, 1961. To-day I have returned to my study of hereditary transmutations after a lapse of a year. A sudden revival of interest.

NOVEMBER 6. I have done it! I have created Supermen! Their bodies are no different. But the brains —ah, there lies the secret! By the aid of the incubator I was able in a few hours to breed and cross-breed those in which the genes regulating the mind were best developed. By delicate operations on some of the genes I succeeded in giving them the power of mental control at a distance. What a commotion this will arouse!

NOVEMBER 8. I have permitted six of them to grow to normal size. Only six, for the rest I killed off. But those six are the pick, the flower of the crop, as the expression goes. All males.

NOVEMBER 9. What a terrible misfortune! My Supermen have escaped. I read to-day that one of them was met in a field by a farm hand. The Superman discovered his power of mental control. *Mein Gott!* To think that this should have happened!

NOVEMBER 23. Yesterday I heard how half of that innocent village was ruthlessly destroyed. I fear they have resolved to make themselves masters of the globe. Of course the pillaged laboratory supplied the materials. Even a Superman cannot make high explosives from nothing.

DECEMBER 4. Tragic! For a while I thought that they had stopped their murdering, but no. Alas! The other half of the village was blown up yesterday.

DECEMBER 19. Things are getting rapidly worse. The Supermen have built an instrument for producing a ray which appears to disintegrate all the molecules of metallic substances.

DECEMBER 20. I have made inquiries. I found that there was in the plundered laboratory one ounce of uranium nitrate. Of course uranium is only weakly radio-active but they seem to have found a way of hastening its decomposition and it is the tremendous power which results, that they use to produce their green ray. But as they have only an ounce of the uranium compound, they must be economical with it and that is why they operate but one small beam. However, I learned that they are going to be shelled out of their mountain to-morrow with six-inch guns.

DECEMBER 21. The guns were of little advantage. The Supermen have devised a system for actually repelling the shells as fast as they arrive. It

takes the form of a rosy-hued glow which encompasses the entire mountain. As soon as a projectile comes in contact with it, it is hurled back a few feet. Like a magnet its force seems to vary inversely proportional to the square of the distance. That is why the shell is jerked so suddenly instead of being gradually retarded.

DECEMBER 22. Eureka! I once exclaimed this when in my folly I made a discovery which might have destroyed mankind. Now I say it again when I have found the means for overcoming the menace of the Supermen.

In looking over a file of papers of some years ago relating to physics, I unearthed a whole set of original experiments on magnetism and its relation to electricity.

In the course of my perusal my eye was attracted to a phrase on the margin of one of the sheets. It was a speculation I had once made on the probable explanation of magnetic attraction and repulsion, which may lead to a way of neutralizing these should my theory prove true. It struck me as curious that I had never tried to verify it experimentally, but the biology class and my other work kept me so busy. And then it occurred to me that, if my theory were substantiated, it would save the world. And the world needs saving now.

WELL, let it suffice when I say that I did succeed in proving the truth of my suppositions. What is even more important, I was able to extend my principle so that like the Supermen I could endow any metal at all with magnetic properties. Now it only remains to perfect a neutralizer and the Supermen will be conquered.

DECEMBER 24. They tried using larger guns, the fools. As if the repulsive glow would not work just as well with large shells as with small ones! However, it doesn't matter. The neutralizing substance has been prepared and the formula sent to the government. I advised them to have a large number of guns concealed so that if the Supermen succeed in destroying a few before they are blown up, there will be enough left to complete the work.

DECEMBER 27. Triumph! The world is saved! But to think that it all might have been averted. There was a celebration. I was awarded a gold medal and they made long speeches. But in spite of all that, I was unhappy. What glories can compensate for the loss of life, the damage, the destruction? And then——.

Here the diary of Professor Carl von Renstein abruptly stops.

THE END

THE TREE TERROR

(*Continued from page* 553)

started to give orders to the amazed, excited men who had been dozing in a dozen empty offices.

"We are saved!" he told them. "It's going to be a long fight and a hard one, but, once the nation is fed, the rest will be easy. All we need is courage and a backbone. Listen to this inventor. Let him talk and then get busy. Radio the specifications of this machine to all of our factories. Tell them to spread the news. In three days the starving, eating cellulose, will be growing strong—made from club moss—and then, when the fear of starvation is gone, we will start to use those forests. A hundred new ways of using cellulose will be found, and Cellulose Consolidated will once again be the greatest commercial organization in the world!"

"Do I get that raise in salary?" asked Simcox.

THE END

The Diamond Lens

By FITZ-JAMES O'BRIEN

The author of the "Diamond Lens" was born in Limerick, Ireland, in 1828. The "Diamond Lens" appeared originally in the Atlantic Monthly in the last century. There is another story of his which ranks with the "Diamond Lens," called "The Wondersmith." A beautiful illustrated limited edition of these two stories has recently been published by William Edwin Rudge, of this city. He also wrote poems and dramas and served in the Civil War in the Seventh Regiment and on the staff of General F. W. Lander. He was severely wounded and died in 1862 after lingering many days. It is fair to call the "Diamond Lens" a classic among short stories.

Illustrated by MOREY

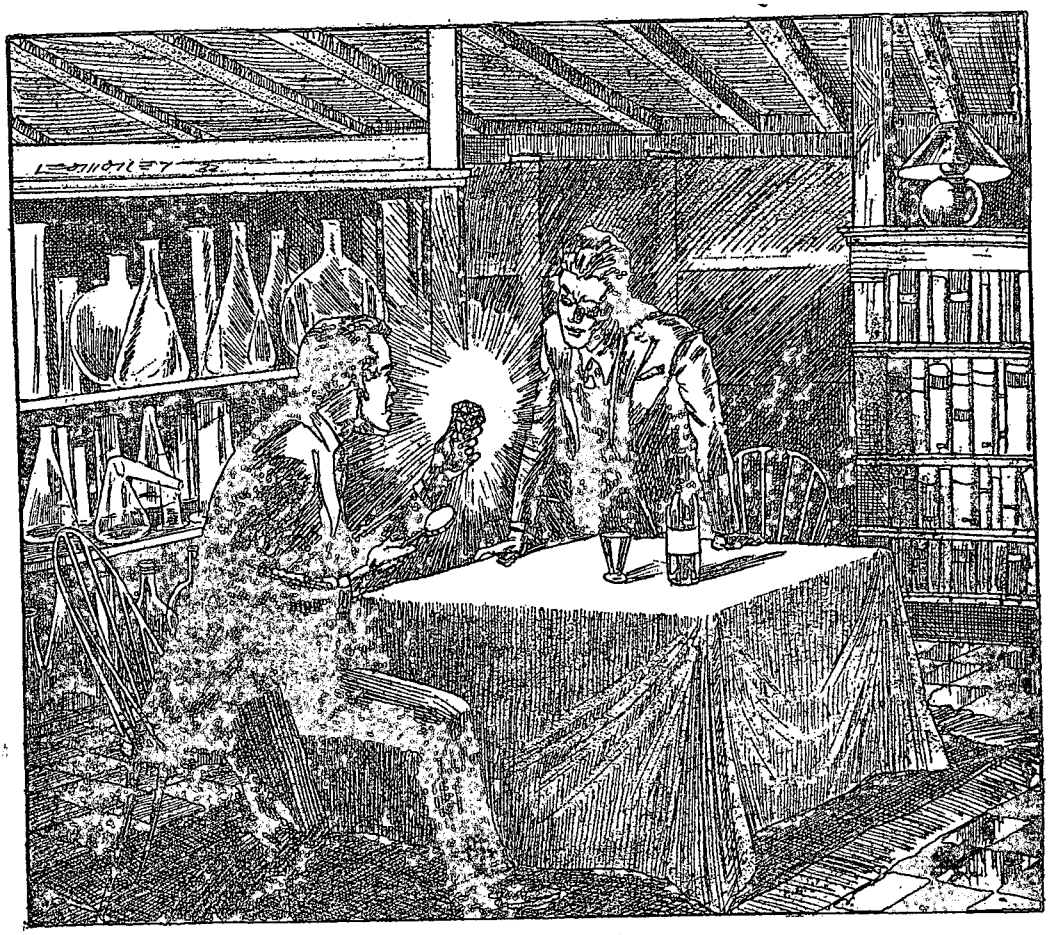
CHAPTER I

FROM a very early period of my life the entire bent of my inclinations had been towards microscopic investigations. When I was not more than ten years old, a distant relative of our family, hoping to astonish my inexperience, constructed a simple microscope for me, by drilling in a disk of copper a small hole, in which a drop of pure water was sustained by capillary attraction. This very primitive apparatus, magnifying some fifty diameters, presented, it is true, only indistinct and imperfect forms, but still sufficiently wonderful to work up my imagination to a preternatural state of excitement.

Seeing me so interested in this rude instrument my cousin explained to me all that he knew about the principles of the microscope, related to me a few of the wonders which had been accomplished through its agency, and ended by promising to send me one regularly constructed, immediately on his return to the city. I counted the days, the hours, the minutes, that intervened between that promise and his departure.

Meantime I was not idle. Every transparent substance that bore the remotest resemblance to a lens I eagerly seized upon, and employed in vain attempts to realize that instrument, the theory of whose construction I as yet only vaguely comprehended. All panes of glass containing those oblate spheroidal knots familiarly known as "bull's eyes" were ruthlessly destroyed, in the hope of obtaining lenses of marvellous power. I even went so far as to extract the crystalline humour from the eyes of fishes and animals, and endeavored to press it into microscopic service. I plead guilty to having stolen the glasses from my Aunt Agatha's spectacles, with a dim idea of grinding them into lenses of wondrous magnifying properties—in which attempt it is scarcely necessary to say that I totally failed.

At last the promised instrument came. It was of that order known as Field's simple microscope, and had cost perhaps about fifteen dollars. As far as educational purposes went, a better apparatus could not have been selected. Accompanying it was a small treatise on the microscope—its history, uses, and discoveries. I comprehended then for the first time the "Arabian Nights Entertainments." The dull veil of ordinary exis-



While Simon was relating this to me, I regarded the great diamond attentively. Never had I beheld anything so beautiful. All the glories of light, ever imagined or described, seemed to pulsate in its crystalline chambers. Its weight, as I learned from Simon, was exactly one hundred and forty carats.

tence that hung across the world seemed suddenly to roll away, and to lay bare a land of enchantments. I felt towards my companions, as the seer might feel towards the ordinary masses of men. I held conversations with nature in a tongue which they could not understand. I was in daily communication with living wonders, such as they never imagined in their wildest visions. I penetrated beyond the external portal of things, and roamed through the sanctuaries. Where they beheld only a drop of rain slowly rolling down the window-glass, I saw a universe of beings animated with all the passions common to physical life, and convulsing their sphere with struggles as fierce and protracted as those of men. In the common spots of mould, which my mother, good housekeeper that she was, fiercely scooped away from her jam pots, there abode for me, under the name of mildew, enchanted gardens, filled with dells and avenues of the densest foliage and most astonishing verdure, while from the fantastic boughs of these microscopic forests hung strange fruits glittering with green, and silver and gold.

It was no scientific thirst that at this time filled my mind. It was the pure enjoyment of a poet to whom a world of wonders had been disclosed. I talked of my solitary pleasures to none. Alone with my microscope, I dimmed my sight, day

after day and night after night, poring over the marvels which it enfolded to me. I was like one who, having discovered the ancient Eden still existing in all its primitive glory, should resolve to enjoy it in solitude, and never betray to mortal the secret of its locality. The rod of my life was bent at this moment. I destined myself to be a microscopist.

Of course, like every novice, I fancied myself a discoverer. I was ignorant at the time of the thousands of acute intellects engaged in the same pursuit as myself, and with the advantage of instruments a thousand times more powerful than mine. The names of Leeuwenhoek, Williamson, Spencer, Errenberg, Schultz, Dujardin, Schact, and Schleiden were then entirely unknown to me, or if known, I was ignorant of their patient and wonderful researches. In every fresh specimen of cryptogamia which I placed beneath my instrument I believed that I discovered wonders of which the world was as yet ignorant. I remember well the thrill of delight and admiration that shot through me the first time I discovered the common wheel animalcule (*Rotifera vulgaris*) expanding and contracting its flexible spokes, and seemingly rotating through the water. Alas! as I grew older, and obtained some works treating of my favorite study, I found that I was only on the threshhold of a science to the investigation of which some of the greatest men of the age were devoting their lives and intellects.

As I grew up, my parents, who saw but little likelihood of anything practical resulting from the examination of bits of moss and drops of water through a brass tube and a piece of glass, were anxious that I should choose a profession. It was their desire that I should enter the counting-house of my uncle, Ethan Blake, a prosperous merchant, who carried on business in New York. This suggestion I decisively combatted. I had no taste for trade; I should only make a failure; in short, I refused to become a merchant.

But it was necessary for me to select some pursuit. My parents were staid New England people, who insisted on the necessity of labor; and therefore, although, thanks to the bequest of my poor Aunt Agatha, I should, on coming of age, inherit a small fortune sufficient to place me above want, it was decided that, instead of waiting for this, I should act the nobler part, and employ the intervening years in rendering myself independent.

After much cogitation I complied with the wishes of my family, and selected a profession. I determined to study medicine at the New York Academy. This disposition of my future suited me. A removal from my relatives would enable me to dispose of my time as I pleased without fear of detection. As long as I paid my Academy fees, I might shirk attending the lectures if I chose; and, as I never had the remotest intention of standing an examination, there was no danger of my being "plucked." Besides, a metropolis was the place for me. There I could obtain excellent instruments, the newest publications, intimacy with men of pursuits kindred with my own—in short, all things necessary to insure a profitable devotion of my life to my beloved science. I had an abundance of money, few desires that were not bounded by my illuminating mirror on one side and my object-glass on the other; what, therefore, was to prevent my becoming an illustrous investigator of the veiled worlds? It was with the most buoyant hope that I left my New England home and established myself in New York.

CHAPTER II

MY first step, of course, was to find suitable apartments. These I obtained, after a couple of days' search, in Fourth Avenue; a very pretty second-floor unfurnished, contain-

ing sitting-room, bed-room, and a smaller apartment which I intended to fit up as a laboratory. I furnished my lodgings simply, but rather elegantly, and then devoted all my energies to the adornment of the temple of my worship. I visited Pike, the celebrated optician, and passed in review his splendid collection of microscopes—Field's Compond, Hingham's, Spencer's, Nachet's Binocular (that founded on the principles of the stereoscope), and at length fixed upon that form known as Spencer's Trunnion Microscope, as combining the greatest number of improvements with an almost perfect freedom from tremor. Along with this I purchased every possible accessory—draw-tubes, micrometers, a *camera-lucida,* lever-stage, achromatic condensers, white cloud illuminators, prisms, parabolic condensers, polarizing apparatus, forceps, aquatic boxes, fishing-tubes, with a host of other articles, all of which have been useful in the hands of an experienced microscopist, but, as I afterwards discovered, were not of the slightest value to me. It takes years of practice to know how to use a complicated microscope. The optician looked suspiciously at me as I made these wholesale purchases. He evidently was uncertain whether to set me down as some scientific celebrity or a madman. I think he inclined to the latter belief. I suppose I was mad. Every great genius is mad upon the subject in which he is greatest. The unsuccessful madman is disgraced and called a lunatic.

Mad or not, I set myself to work with a zeal which few scientific students have ever equalled. I had everything to learn relative to the delicate study upon which I had embarked—a study involving the most earnest patience, the most rigid analytic powers, the steadiest hand, the most untiring eye, the most refined and subtle manipulation.

For a long time half my apparatus lay inactively on the shelves of my laboratory, which was now most amply furnished with every possible contrivance for facilitating my investigations. The fact was that I did not know how to use some of my scientific implements—never having been taught microscopics—and those whose use I understood theoretically were of little avail, until by practice I could attain the necessary delicacy of handling. Still, such was the fury of my ambition, such the untiring perseverance of my experiments, that, difficult of credit as it may be, in the course of one year I became theoretically and practically an accomplished microscopist.

During this period of my labors, in which I submitted specimens of every substance that came under my observance to the action of my lenses, I became a discoverer—in a small way, it is true, for I was very young, but still a discoverer. It was I who destroyed Ehrenberg's theory that the *Volvox globator* was an animal, and proved that his "monads" with stomachs and eyes were merely phases of the formation of a vegetable cell, and were, when they reached their mature state, incapable of the act of conjugation, or any true generative act, without which no organism rising to any stage of life higher than vegetable can be said to be complete. It was I who resolved the singular problem of rotation in the cells and hairs of plants into ciliary attraction, in spite of the assertions of Mr. Wenham and others, that my explanation was the result of an optical illusion.

But notwithstanding these discoveries, laboriously and painfully made as they were, I felt horribly dissatisfied. At every step I found myself stopped by the imperfections of my instruments. Like all active microscopists, I gave my imagination full play. Indeed, it is a common complaint against many such, that they supply the defects of their instruments

with the creations of their brains. I imagined depths beyond depths in nature which the limited power of my lenses prohibited me from exploring. I lay awake at night constructing imaginary microscopes of immeasurable power, with which I seemed to pierce through all the envelopes of matter down to its original atom. How I cursed those imperfect media which necessity through ignorance compelled me to use! How I longed to discover the secret of some perfect lens, whose magnifying power should be limited only by the resolvability of the object, and which at the same time should be free from spherical and chromatic aberrations, in short from all the obstacles over which the poor microscopist finds himself continually stumbling! I felt convinced that the simple microscope, composed of a single lens of such vast yet perfect power, was possible of construction. To attempt to bring the compound microscope up to such a pitch would have been commencing at the wrong end; this latter being simply a partially successful endeavor to remedy those very defects of the simple instrument, which, if conquered, would leave nothing to be desired.

It was in this mood of mind that I became a constructive microscopist. After another year passed in this new pursuit, experimenting on every imaginable substance—glass, gems, flints, crystals, artificial crystals formed of the alloy of various vitreous materials—in short, having constructed as many varieties of lenses as Argus had eyes, I found myself precisely where I started, with nothing gained save an extensive knowledge of glass-making. I was almost dead with despair. My parents were surprised at my apparent want of progress in my medical studies, (I had not attended one lecture since my arrival in the city), and the expenses of my mad pursuit had been so great as to embarrass me very seriously.

I was in this frame of mind one day, experimenting in my laboratory on a small diamond—that stone, from its great refracting power, having always occupied my attention more than any other—when a young Frenchman, who lived on the floor above me, and who was in the habit of occasionally visiting me, entered the room.

I think that Jules Simon was a Jew. He had many traits of the Hebrew character: a love of jewelry, of dress, of good living. There was something mysterious about him. He always had something to sell, and yet went into excellent society. When I say sell, I should perhaps have said peddle; for his operations were generally confined to the disposal of single articles—a picture, for instance, or a rare carving in ivory, or a pair of duelling-pistols, or the dress of a Mexican *caballero*. When I was first furnishing my rooms, he paid me a visit, which ended in my purchasing an antique silver lamp, which he assured me was a Cellini—it was handsome enough even for that—and some other knickknacks for my sitting room. Why Simon should pursue this petty trade I never could imagine. He apparently had plenty of money, and had the *entrée* of the best houses in the city—taking care, however, I suppose, to drive no bargains within the enchanted circle of the Upper Ten. I came at length to the conclusion that this peddling was but a mask to cover some greater object, and even went so far as to believe my young acquaintance to be implicated in the slave-trade. That, however, was none of my affair.

On the present occasion, Simon entered my room in a state of considerable excitement.

"Ah, mon ami!" he cried, before I could even offer him the ordinary salutation, "it has occurred to me to be the witness of the most astonishing things in the world. I promenade myself to the

house of Madame —— How does the little animal *le renard*—name himself in the Latin?"

"Vulpes," I answered.

"Ah! yes—Vulpes. I promenade myself to the house of Madame Vulpes."

"The spirit medium?"

"Yes, the great medium. Great heavens! what a woman! I write on a slip of paper many questions concerning affairs the most secret—affairs that conceal themselves in the abysses of my heart the most profound; and behold! by example! what occurs! This devil of a woman makes me replies the most truthful to all of them. She talks to me of things that I do not love to talk of myself. What am I to think? I am fixed to the earth!"

"Am I to understand you, M. Simon, that this Mrs. Vulpes replied to questions secretly written by you, which questions related to events known only to yourself?"

"Ah! moré than that, more than that," he answered, with an air of some alarm. "She related to me things— But," he added after a pause and suddenly changing his manner, "why occupy ourselves with these follies? It was all the biology, without doubt. It goes without saying that it has not my credence.—But why are we here, *mon ami*? It has occurred to me to discover the most beautiful thing as you can imagine—a vase with green lizards on it, composed by the great Bernard Palissy. It is in my apartment; let us mount. I will show it to you."

I followed Simon mechanically; but my thoughts were far from Palissy and his enamelled ware, although I, like him, was seeking in the dark a great discovery. This casual mention of the spiritualist, Madame Vulpes, set me on a new track. What if this spiritualism should be really a great fact? What if, through communication with more subtile organisms than my own, I could reach at a single bound the goal, which perhaps a life of agonizing mental toil would never enable me to attain?

While purchasing the Palissy vase from my friend Simon, I was mentally arranging a visit to Madame Vulpes.

CHAPTER III

TWO evenings after this, thanks to an arrangement by letter and the promise of an ample fee, I found Madame Vulpes awaiting me at her residence alone. She was a coarse-featured woman, with keen and rather cruel dark eyes, and an exceedingly sensual expression about her mouth and under jaw. She received me in perfect silence, in an apartment on the ground floor, very sparsely furnished. In the centre of the room, close to where Mrs. Vulpes sat, there was a common round mahogany table. If I had come for the purpose of sweeping her chimney, the woman could not have looked more indifferent to my appearance. There was no attempt to inspire the visitor with awe. Everything bore a simple and practical aspect. This intercourse with the spiritual world was evidently as familiar an occupation with Mrs. Vulpes as eating her dinner or riding in an omnibus.

"You come for a communication, Mr. Linley?" said the medium, in a dry, business-like tone of voice.

"By appointment—yes."

"What sort of communication do you want?—a written one?"

"Yes—I wish for a written one."

"From any particular spirit?"

"Yes."

"Have you ever known this spirit on this earth?"

"Never. He died long before I was born. I wish merely to obtain from him some information which he ought to be able to give better than any other."

"Will you seat yourself at the table, Mr. Linley," said the medium, "and place your hands upon it?"

I obeyed—Mrs. Vulpes being seated opposite to me, with her hands also on the table. We remained thus for about a minute and a half, when a violent succession of raps came on the table, on the back of my chair, on the floor immediately under my feet, and even on the windowpanes. Mrs. Vulpes smiled composedly.

"They are very strong to-night," she remarked. "You are fortunate." Then she continued, "Will the spirits communicate with this gentleman?"

Vigorous affirmative.

"Will the particular spirit he desires to speak with communicate?"

A very confused rapping followed this question.

"I know what they mean," said Mrs. Vulpes, addressing herself to me; "they wish you to write down the name of the particular spirit that you desire to converse with. Is that so?" she added, speaking to her invisible guests.

That it was so was evident from the numerous affirmatory responses. While this was going on, I tore a slip from my pocket-book, and scribbled a name, under the table.

"Will this spirit communicate in writing with this gentleman?" asked the medium once more.

After a moment's pause, her hand had seemed to be seized with a violent tremor, shaking so forcibly that the table vibrated. She said that a spirit had seized her hand and would write. I handed her some sheets of paper that were on the table, and a pencil. The latter she held loosely in her hand, which presently began to move over the paper with a singular and seemingly involuntary motion. After a few moments had elapsed, she handed me the paper, on which I had found written, in a large, uncultivated hand, the words, "He is not here, but has been sent for." A pause of a minute or so now ensued, during which Mrs. Vulpes remained perfectly silent, but the raps continued at regular intervals. When the short period I mentioned had elapsed, the hand of the medium was again seized with its convulsive tremor, and she wrote, under this strange influence, a few words on the paper, which she handed to me. They were as follows:

"I am here. Question me.

"LEEUWENHOEK."

I was astounded. The name was identical with that I had written beneath the table, and carefully kept concealed. Neither was it at all probable that an uncultivated woman like Mrs. Vulpes should know even the name of the great father of microscopics. It may have been biology! but this theory was soon doomed to be destroyed. I wrote on my slip—still concealing it from Mrs. Vulpes—a series of questions, which, to avoid tediousness, I shall place with the responses, in the order in which they occurred:

I—Can the microscope be brought to perfection?"

SPIRIT—Yes.

I—Am I destined to accomplish this great task?

SPIRIT—You are.

I—I wish to know how to proceed to attain this end; for the love which you bear to science, help me!

SPIRIT—A diamond of one hundred and forty carats, submitted to electro-magnetic currents for a long period, will experience a rearrangement of its atoms *inter se*, and from that stone you will form the universal lens.

I—Will great discoveries result from the use of such a lens?

SPIRIT—So great that all that has gone before is as nothing.

I—But the refractive power of the diamond is so immense, that the image will be formed within the lens. How

is that great difficulty to be surmounted?

SPIRIT—Pierce the lens through its axis, and the difficulty is obviated. The image will be formed in the pierced space, which will itself serve as a tube to look through. Now I am called. Good night.

I cannot at all describe the effect that these extraordinary communications had upon me. I felt completely bewildered. No biological theory could account for the *discovery* of the lens. The medium might, by means of biological *rapport* with my mind, have gone so far as to read my questions, and reply to them coherently. But biology could not enable her to discover that magnetic currents would so alter the crystals of the diamond as to remedy its previous defects, and admit of its being polished into a perfect lens. Some such theory may have passed through my head, it is true; but if so I had forgotten it. In my excited condition of mind there was no course left but to become a convert, and I was in a state of the most painful nervous exaltation when I left the medium's house that evening. She accompanied me to the door, hoping that I was satisfied. The raps followed us as we went through the hall, sounding on the balusters, the flooring, and even the lintels of the door. I hastily expressed my satisfaction, and escaped hurriedly into the cool night air. I walked home with but one thought possessing me —how to obtain a diamond of the immense size required. My entire means multiplied a hundred times over would have been inadequate to its purchase. Besides, such stones are rare, and become historical. I could find such only in the regalia of Eastern or European monarchs.

CHAPTER IV

THERE was a light in Simon's room as I entered my house. A vague impulse urged me to visit him. As I opened the door of his sitting-room unannounced, he was bending, with his back toward me, over a Carcel lamp, apparently engaged in minutely examining some object which he held in his hands. As I entered, he started suddenly, thrust his hand into his breast pocket, and turned to me with a face crimson with confusion.

"What!" I cried, "poring over the miniature of some fair lady? Well, don't blush so much; I won't ask to see it."

Simon laughed awkwardly enough, but made none of the negative protestations usual on such occasions. He asked me to take a seat.

"Simon," said I, "I have just come from Madame Vulpes."

This time Simon turned as white as a sheet, and seemed stupefied, as if a sudden electric shock had smitten him. He babbled some incoherent words, and went hastily to a small closet where he usually kept his liquors. Although astonished at his emotion, I was too preoccupied with my own idea to pay much attention to anything else.

"You say truly when you call Madame Vulpes a devil of a woman," I continued. "Simon, she told me wonderful things to-night, or rather was the means of telling me wonderful things! Ah! if I could only get a diamond that weighed one hundred and forty carats!"

Scarcely had the sigh with which I uttered this desire died upon my lips, when Simon, with the aspect of a wild beast, glared at me savagely, and, rushing to the mantelpiece, where some foreign weapons hung on the wall, caught up a Malay creese, and brandished it furiously before him. "No!" he cried in French, into which he always broke when excited. "No! you shall not have it! You are perfidious! You have consulted with that demon, and desire my treasure! But I shall die first! Me! I am brave! You cannot make me fear!"

All this, uttered in a loud voice trem-

bling with excitement, astounded me. I saw at a glance that I had accidentally trodden upon the edges of Simon's secret, whatever it was. It was necessary to reassure him.

"My dear Simon," I said, "I am entirely at a loss to know what you mean. I went to Madame Vulpes to consult her on a scientific problem, to the solution of which I discovered that a diamond of the size I just mentioned was necessary. You were never alluded to during the evening, nor, so far as I was concerned, even thought of. What can be the meaning of this outburst? If you happen to have a set of valuable diamonds in your possession, you need fear nothing from me. The diamond which I require you could not possess; or, if you did possess it, you would not be living here."

Something in my tone must have completely reassured him; for his expression immediately changed to a sort of constrained merriment, combined, however, with a certain suspicious attention to my movements. He laughed, and said that I must bear with him; that he was at certain moments subject to a species of vertigo, which betrayed itself in incoherent speeches, and that the attacks passed off as rapidly as they came. He put his weapon aside while making this explanation, and endeavored, with some success, to assume a more cheerful air.

All this did not impose on me in the least. I was too much accustomed to analytical labors to be baffled by so flimsy a veil. I determined to probe the mystery to the bottom.

"Simon," I said gayly, "let us forget all this over a bottle of Burgundy. I have a case of Lausseure's *Clos Vougeot* downstairs, fragrant with the odors and ruddy with the sunlight of Côte d'Or. Let us have up a couple of bottles. What say you?"

"With all my heart," answered Simon, smilingly.

I produced the wine and we seated ourselves to drink. It was of a famous vintage, that of 1848, a year when war and wine throve together—and its pure but powerful juice seemed to impart renewed vitality to the system. By the time we had half finished the second bottle, Simon's head, which I knew was a weak one, had begun to yield, while I remained as calm as ever, only that every draught seemed to send a flush of vigor through my limbs. Simon's utterance became more and more indistinct. He took to singing French chansons of a not very moral tendency. I rose suddenly from the table just at the conclusion of one of those incoherent verses, and, fixing my eyes on him with a quiet smile, said: "Simon, I have deceived you. I learned your secret this evening. You may as well be frank with me. Mrs. Vulpes, or rather one of her spirits, told me all."

He started with horror. His intoxication seemed for the moment to fade away, and he made a movement towards the weapon that he had a short time before laid down. I stopped him with my hand.

"Monster!" he cried passionately, "I am ruined! What shall I do? You shall never have it! I swear it by my mother!"

"I don't want it," I said; "rest secure, but be frank with me. Tell me all about it."

The drunkenness began to return. He protested with maudlin earnestness that I was entirely mistaken—that I was intoxicated; then asked me to swear eternal secrecy, and promised to disclose the mystery to me. I pledged myself, of course, to all. With an uneasy look in his eyes, and hands unsteady with drink and nervousness, he drew a small case from his breast and opened it. Heavens! How the mild lamp-light was shivered into a thousand prismatic arrows, as it fell upon a vast rose-diamond that glittered in the case! I was no judge of diamonds, but I saw at a glance that this was a gem

of rare size and purity. I looked at Simon with wonder, and—must I confess it?—with envy. How could he have obtained this treasure? In reply to my questions, I could just gather from his drunken statements (of which, I fancy, half the incoherence was affected) that he had been superintending a gang of slaves engaged in diamond-washing in Brazil; that he had seen one of them secrete a diamond, but, instead of informing his employers, had quietly watched the negro until he saw him bury his treasure; that he had dug it up and fled with it, but that as yet he was afraid to attempt to dispose of it publicly—so valuable a gem being certain to attract too much attention to its owner's antecedents—and he had not been able to discover any of those obscure channels by which such matters are conveyed away safely. He added, that, in accordance with the oriental practice, he had named his diamond with the fanciful title of "The Eye of Morning."

While Simon was relating this to me, I regarded the great diamond attentively. Never had I beheld anything so beautiful. All the glories of light, ever imagined or described, seemed to pulsate in its crystalline chambers. Its weight, as I learned from Simon, was exactly one hundred and forty carats. Here was an amazing coincidence. The hand of destiny seemed in it. On the very evening when the spirit of Leeuwenhoek communicates to me the great secret of the microscope, the priceless means which he directs me to employ start up within my easy reach! I determined, with the most perfect deliberation, to possess myself of Simon's diamond.

I sat opposite to him while he nodded over his glass, and calmly revolved the whole affair. I did not for an instant contemplate so foolish an act as a common theft, which would of course be discovered, or at least necessitate flight and concealment, all of which must interfere with my scientific plans. There was but one step to be taken—to kill Simon. After all, what was the life of a little peddling Jew, in comparison with the interests of science? Human beings are taken every day from the condemned prisons to be experimented on by surgeons. This man, Simon, was by his own confession a criminal, a robber, and I believed on my soul a murderer. He deserved death quite as much as any felon condemned by the laws; why should not I, like the government, contrive that his punishment should contribute to the progress of human knowledge?

The means for accomplishing everything I desired lay within my reach. There stood upon the mantelpiece a bottle half full of French laudanum. Simon was so occupied with his diamond, which I had just restored to him, that it was an affair of no difficulty to drug his glass. In a quarter of an hour he was in a profound sleep.

I now opened his waistcoat, took the diamond from the inner pocket in which he had placed it, and removed him to the bed, on which I laid him so that his feet hung down over the edge. I had possessed myself of the Malay creese, which I held in my right hand, while with the other I discovered as accurately as I could by pulsation the exact locality of the heart. It was essential that all the aspects of his death should lead to the surmise of self-murder. I calculated the exact angle at which it was probable that the weapon, if levelled by Simon's own hand, would enter his breast; then with one powerful blow I thrust it up to the hilt in the very spot which I desired to penetrate. A convulsive thrill ran through Simon's limbs. I heard a smothered sound issue from his throat, precisely like the bursting of a large air-bubble, sent up by a diver, when it reaches the surface of the water; he turned half around on his side,

and, as if to assist my plans more effectually, his right hand, moved by some mere spasmodic impulse, clasped the handle of the creese, which it remained holding with extraordinary muscular tenacity. Beyond this there was no apparent struggle. The laudanum, I presume, paralyzed the usual nervous action. He must have died instantly.

There was yet something to be done. To make it certain that all suspicion of the act should be diverted from any inhabitant of the house to Simon himself, it was necessary that the door should be found in the morning *locked on the inside*. How to do this, and afterwards escape myself? Not by the window; that was a physical impossibility. Besides, I was determined that the windows *also* should be found bolted. The solution was simple enough. I descended softly to my own room for a peculiar instrument which I had used for holding small slippery substances, such as minute spheres of glass, etc. This instrument was nothing more than a long slender hand-vice, with a very powerful grip, and a considerable leverage, which last was accidentally owing to the shape of the handle. Nothing was simpler than, when the key was in the lock, to seize the end of its stem in this vise, through the keyhole, from the outside, and so lock the door. Previously, however, to doing this, I burned a number of papers on Simon's hearth. Suicides almost always burn papers before they destroy themselves. I also emptied some more laudanum into Simon's glass—having first removed from it all traces of wine—cleaned the other wine-glass, and brought the bottles away with me. If traces of two persons drinking had been found in the room, the question would naturally have arisen, Who was the second? Besides, the wine-bottles might have been identified as belonging to me. The laudanum I poured out to account for its presence in his stomach, in case of a *post-mortem examination*. The theory naturally would be, that he first intended to poison himself, but, after swallowing a little of the drug, was either disgusted with its taste, or changed his mind from other motives, and chose the dagger. These arrangements made, I walked out, leaving the gas burning, locked the door with my vice, and went to bed.

Simon's death was not discovered until nearly three in the afternoon. The servant, astonished at seeing the gas burning—the light streaming on the dark landing from under the door—peeped through the keyhole and saw Simon on the bed. She gave the alarm. The door was burst open, and the neighborhood was in a fever of excitement.

Every one in the house was arrested, myself included. There was an inquest; but no clew to his death beyond that of suicide could be obtained. Curiously enough, he had made several speeches to his friends the preceding week, that seemed to point to self-destruction. One gentleman swore that Simon had said in his presence that "he was tired of life." His landlord affirmed that Simon, when paying him his last month's rent, remarked that "he should not pay him rent much longer." All the other evidence corresponded—the door locked inside, the position of the corpse, the burnt papers. As I anticipated, no one knew of the possession of the diamond by Simon, so that no motive was suggested for his murder. The jury, after a prolonged examination, brought in the usual verdict, and the neighborhood once more settled down into its accustomed quiet.

CHAPTER V

THE three months succeeding Simon's catastrophe I devoted night and day to my diamond lens. I had constructed a vast galvanic battery, composed of nearly two thousand pairs

of plates—a higher power I dared not use, lest the diamond should be calcined. By means of this enormous engine I was enabled to send a powerful current of electricity continually through my great diamond, which it seemed to me gained in lustre every day. At the expiration of a month I commenced the grinding and polishing of the lens, a work of intense toil and exquisite delicacy. The great density of the stone, and the care required to be taken with the curvatures of the surfaces of the lens, rendered the labor the severest and most harassing that I had yet undergone.

At last the eventful moment came; the lens was completed. I stood trembling on the threshold of new worlds. I had the realization of Alexander's famous wish before me. The lens lay on the table, ready to be placed upon its platform. My hand fairly shook as I enveloped a drop of water with a thin coating of oil of turpentine, preparatory to its examination—a process necessary in order to prevent the rapid evaporation of the water. I now placed the drop on a thin slip of glass under the lens, and throwing upon it, by the combined aid of a prism and a mirror, a powerful stream of light. I approached my eye to the minute hole drilled through the axis of the lens. For an instant I saw nothing save what seemed to be an illuminated chaos, a vast luminous abyss. A pure white light, cloudless and serene, and seemingly limitless as space itself, was my first impression. Gently, and with the greatest care, I depressed the lens a few hair's-breadths. The wondrous illumination still continued, but as the lens approached the object a scene of indescribable beauty was unfolded to my view.

I seemed to gaze upon a vast space, the limits of which extended far beyond my vision. An atmosphere of magical luminousness permeated the entire field of view. I was amazed to see no trace of animalculous life. Not a living thing, apparently, inhabited that dazzling expanse. I comprehended instantly that, by the wondrous power of my lens, I had penetrated beyond the grosser particles of aqueous matter, beyond the realms of infusoria and protozoa, down to the original gaseous globule, into whose luminous interior I was gazing, as into an almost boundless dome filled with a supernatural radiance.

It was, however, no brilliant void into which I looked. On every side I beheld beautiful organic forms, of unknown texture, and colored with the most enchanting hues. These forms presented the appearance of what might be called, for want of a more specific definition, foliated clouds of the highest rarity; that is, they undulated and broke into vegetable formations, and were tinged with splendors compared with which the gilding of our autumn woodlands is as dross compared with gold. Far away into the illimitable distance stretched long avenues of these gaseous forests, dimly transparent, and painted with prismatic hues of unimaginable brilliancy. The pendant branches waved along the fluid glades until every vista seemed to break through half-lucent ranks of many-colored drooping silken pennons. What seemed to be either fruits or flowers, pied with a thousand hues, lustrous and ever varying, bubbled from the crowns of this fairy foliage. No hills, no lakes, no rivers, no forms animate or inanimate, were to be seen, save those vast auroral copses that floated serenely in the luminous stillness, with leaves and fruits and flowers gleaming with unknown fires, unrealizable by mere imagination.

How strange, I thought, that this sphere should be thus condemned to solitude! I had hoped, at least, to discover some new form of animal life—which perhaps is of a lower class than any with which we are at present acquainted, but

still, some living organism. I found my newly discovered world, if I may so speak, a beautiful chromatic desert.

While I was speculating on the singular arrangements of the internal economy of Nature, with which she so frequently splinters into atoms our most compact theories, I thought I beheld a form moving slowly through the glades of one of the prismatic forests. I looked more attentively, and found that I was not mistaken. Words cannot depict the anxiety with which I awaited the nearer approach of this mysterious object. Was it merely some inanimate substance, held in suspense in the attenuated atmosphere of the globule? Or was it an animal endowed with vitality and motion? It approached, flitting behind the gauzy, colored veils of cloud-foliage, for seconds dimly revealed, then vanishing. At last the violet pennons that trailed nearest to me vibrated; they were gently pushed aside, and the form floated out into the broad light.

It was a female human shape. When I say human, I mean it possessed the outlines of humanity—but there the analogy ends. Its adorable beauty lifted it to illimitable heights beyond the loveliest daughter of Adam.

I cannot, I dare not, attempt to inventory the charms of this divine revelation of perfect beauty. Those eyes of mystic violet, dewy and serene, evade my words. Her long, lustrous hair following her glorious head in a golden wake, like the track sown in heaven by a falling star, seems to quench my most burning phrases with its splendors. If all the bees of Hybla nestled upon my lips, they would still sing but hoarsely the wondrous harmonies of outline that enclosed her form.

She swept out from between rainbow-curtains of the cloud-trees into the broad sea of light that lay beyond. Her motions were those of some graceful naiad, cleaving, by a mere effort of her will, the clear, unruffled waters that fill the chambers of the sea. She floated forth with the serene grace of a frail bubble ascending through the still atmosphere of a June day. The perfect roundness of her limbs formed suave and enchanting curves. It was like listening to the most spiritual symphony of Beethoven the divine, to watch the harmonious flow of lines. This, indeed, was a pleasure cheaply purchased at any price. What cared I, if I had waded to the portal of this wonder through another's blood? I would have given my own to enjoy one such moment of intoxication and delight.

Breathless with gazing on this lovely wonder, and forgetful for an instant of everything save her presence, I withdrew my eye from the microscope eagerly—alas! And as my eye fell on the thin slide that lay beneath my instrument, the bright light from mirror and from prism sparkled on a colorless drop of water! There, in that tiny bead of dew, this beautiful being was forever imprisoned. The planet Neptune was not more distant from me than she. I hastened once more to apply my eye to the microscope.

Animula (let me now call her by that dear name which I subsequently bestowed on her) had changed her position. She had again approached the wondrous forest, and was gazing earnestly upwards. Presently one of the trees—as I must call them—unfolded a long ciliary process, with which it seized one of the gleaming fruits that glittered on its summit, and sweeping slowly down, held it within reach of Animula. The sylph took it in her delicate hand and began to eat. My attention was so entirely absorbed by her, that I could not apply myself to the task of determining whether this singular plant was or was not instinct with volition.

I watched her, with the most profound attention as she made her repast. The suppleness of her motions sent a thrill of

delight through my frame; my heart beat madly as she turned her beautiful eyes in the direction of the spot in which I stood. What would I not have given to have had the power to precipitate myself into that luminous ocean, and float with her through those groves of purple and gold! While I was thus breathlessly following her every movement, she suddenly started, seemed to listen for a moment, and then cleaving the brilliant ether in which she was floating, like a flash of light, pierced the opaline forest, and disappeared.

Instantly a series of the most singular sensations attacked me. It seemed as if I had suddenly gone blind. The luminous sphere was still before me, but my daylight had vanished. What caused this sudden disappearance? Had she a lover or a husband? Yes, that was the solution! Some signal from a happy fellow-being had vibrated through the avenues of the forest, and she had obeyed the summons.

The agony of my sensations, as I arrived at this conclusion, startled me. I tried to reject the conviction that my reason forced upon me. I battled against the fatal conclusion—but in vain. It was so. I had no escape from it. I loved an animalcule!

It is true that, thanks to the marvellous power of my microscope, she appeared of human proportions. Instead of presenting the revolting aspect of the coarser creatures, that live and struggle and die, in the more easily resolvable portions of the waterdrop, she was fair and delicate and of surpassing beauty. But of what account was all that? Every time that my eye was withdrawn from the instrument, it fell on a miserable drop of water, within which, I must be content to know, dwelt all that could make my life lovely.

Could she but see me once! Could I for one moment pierce the mystic walls that so inexorably rose to separate us, and whisper all that filled my soul, I might consent to be satisfied for the rest of my life with the knowledge of her remote sympathy. It would be something to have established even the faintest personal link to bind us together—to know that at times, when roaming through those enchanted glades, she might think of the wonderful stranger, who had broken the monotony of her life with his presence, and left a gentle memory in her heart!

But it could not be. No invention of which human intellect was capable could break down the barriers that nature had erected. I might feast my soul upon her wondrous beauty, yet she must always remain ignorant of the adoring eyes that day and night gazed upon her, and, even when closed, beheld her in dreams. With a bitter cry of anguish I fled from the room, and flinging myself on my bed, sobbed myself to sleep like a child.

CHAPTER VI

I AROSE the next morning almost at daybreak, and rushed to my microscope. I trembled as I sought the luminous world in miniature that contained my all. Animula was there. I had left the gas-lamp, surrounded by its moderators, burning, when I went to bed the night before. I found the sylph bathing, as it were, with an expression of pleasure animating her features, in the brilliant light which surrounded her. She tossed her lustrous golden hair over her shoulders with innocent coquetry. She lay at full length in the transparent medium, in which she supported herself with ease, and gambolled with the enchanting grace that the nymph Salamacis might have exhibited when she sought to conquer the modest Hermaphroditus. I tried an experiment to satisfy myself if her powers of reflection were developed. I lessened the lamplight considerably. By the dim light that remained, I could see

an expression of pain flit across her face. She looked up suddenly, and her brows contracted. I flooded the stage of the microscope again with a full stream of light, and her whole expression changed. She sprang forward like some substance deprived of all weight. Her eyes sparkled and her lips moved. Ah! if science had only the means of conducting and reduplicating sounds, as it does the rays of light, what carols of happiness would then have entranced my ears! what jubilant hymns to Adonis would have thrilled the illuminated air!

I now comprehended how it was that the Count de Gabalis peopled his mystic world with sylphs—beautiful beings whose breath of life was lambent fire, and who sported forever in regions of purest ether and purest light. The Rosicrucian had anticipated the wonder that I had practically realized.

How long this worship of my strange divinity went on thus I scarcely know. I lost all note of time. All day from early dawn, and far into the night, I was to be found peering through that wonderful lens. I saw no one, went nowhere, and scarce allowed myself sufficient time for my meals. My whole life was absorbed in contemplation as rapt as that of any of the Romish saints. Every hour that I gazed upon the divine form strengthened my passion—a passion that was always overshadowed by the maddening conviction, that, although I could gaze on her at will, she never, never could behold me!

At length, I grew so pale and emaciated, from want of rest, and continual brooding over my insane love and its cruel conditions, that I determined to make some effort to wean myself from it. "Come," I said, "this is at best a fantasy. Your imagination has bestowed on Animula charms which in reality she does not possess. Seclusion from female society has produced this morbid condition of mind. Compare her with the beautiful women of your own world, and this false enchantment will vanish."

I looked over the newspapers by chance. There I beheld the advertisement of a celebrated *danseuse* who appeared nightly at Niblo's*. The Signorina Caradolce had the reputation of being the most beautiful as well as the most graceful woman in the world. I instantly dressed and went to the theatre.

The curtain drew up. The usual semicircle of fairies in white muslin were standing on the right toe around the enamelled flower-bank, of green canvas, on which the belated prince was sleeping. Suddenly a flute is heard. The fairies start. The trees open, the fairies all stand on the left toe, and the queen enters. It was the Signorina. She bounded forward amid thunders of applause, and, lighting on one foot, remained poised in air. Heavens! was this the great enchantress that had drawn monarchs at her chariot-wheels? Those heavy muscular limbs, those thick ankles, those cavernous eyes, that stereotyped smile, those crudely painted cheeks! Where were the vermeil blooms, the liquid expressive eyes, the harmonious limbs of Animula?

The Signorina danced. What gross, discordant movements! The play of her limbs was all false and artificial. Her bounds were painful athletic efforts; her poses were angular and distressed the eye. I could bear it no longer; with an exclamation of disgust that drew every eye upon me, I rose from my seat in the very middle of the Signorina's *pas-de-fascination,* and abruptly quitted the house.

I hastened home to feast my eyes once more on the lovely form of my sylph. I felt that henceforth to combat this passion would be impossible. I applied my eye to the lens. Animula was there—but what could have happened? Some terri-

* Niblo's Garden was a famous old-time New York theatre.—Ed.

ble change seemed to have taken place during my absence. Some secret grief seemed to cloud the lovely features of her I gazed upon. Her face had grown thin and haggard; her limbs trailed heavily; the wondrous lustre of her golden hair had faded. She was ill!—ill, and I could not assist her! I believe at that moment that I would have gladly forfeited all claims to my human birthright, if I could only have been drafted to the size of an animalcule, and permitted to console her from whom fate had forever divided me.

I racked my brain for the solution of this mystery. What was it that afflicted the sylph? She seemed to suffer intense pain. Her features contracted, and she even writhed, as if with some internal agony. The wondrous forests appeared also to have lost half their beauty. Their hues were dim and in some places faded away altogether. I watched Animula for hours with a breaking heart, and she seemed absolutely to wither away under my very eye. Suddenly I remembered that I had not looked at the water-drop for several days. In fact, I hated to see it; for it reminded me of the natural barrier between Animula and myself. I hurriedly looked down on the stage of the microscope. The slide was still there—but, great heavens! the water-drop had vanished! The awful truth burst upon me; it had evaporated, until it had become so minute as to be invisible to the naked eye; I had been gazing on its last atom, the one that contained Animula—and she was dying.

I rushed again to the front of the lens, and looked through. Alas! the last agony had seized her. The rainbow-hued forests had all melted away, and Animula lay struggling feebly in what seemed to be a spot of dim light. Ah! the sight was horrible: the limbs once so round and lovely shrivelling up into nothings; the eyes—those eyes that shone like heaven—being quenched into black dust; the lustrous golden hair now lank and discolored. The last throe came. I beheld that final struggle of the blackening form—and I fainted.

When I awoke out of a trance of many hours, I found myself lying amid the wreck of my instrument, myself as shattered in mind and body as it is. I crawled feebly to my bed, from which I did not rise for months.

They say now that I am mad; but they are mistaken. I am poor, for I have neither the heart nor the will to work; all my money is spent, and I live on charity. Young Men's Associations that love a joke invite me to lecture on Optics before them, for which they pay me, and laugh at me while I lecture. "Linley, the mad microscopist," is the name I go by. I suppose that I talk incoherently while I lecture. Who could talk sense when his brain is haunted by such ghastly memories, while ever and anon among the shapes of death I behold the radiant form of my lost Animula!

THE END

In the Realm of Books

"Lake of Fire," by Lionel Houser. Published by Claude Kendall, 80—5th Avenue, 295 pages, $2.50, a story of high adventure in far away Burma.

Haldron Norris has to keep away from the United States under the terms of a will made by his eccentric father, one of the Oil Magnates. Norris has cruised to Burma accompanied by a beautiful girl and by her ambitious mother. (The father's will has almost stipulated marriage of this girl to his son).

The girl is using all her bait to make him bite, having a keen weather eye for the countless millions to come, when the terms of the will have been fulfilled. Arrives a cable informing Norris that his pal and best friend is dying, and the love for his friend almost makes him go back to the United States, will or no will. Then arrives also the solution —a physical double whom he meets in one of the dives. The double agrees to impersonate him for a stipulated fee, but the double pulls a double cross on him of the worst type.—The scoundrel beats him insensible, then mutilates him with a razorblade beyond all possible recognition, marries the girl and in time falls heir to the immense fortune.

Norris has fallen heir to the double's native sweetheart and after years of wandering in the Burmese jungles with all kinds of fantastic adventures thrown in for good measure, he accomplishes his revenge in San Francisco.

A good yarn, well told.

"Full Circle," by John Collier. Published by D. Appleton & Co., New York, 290 pages, $2.00. In 1906 Harper & Bros. published *"The Doomsman,"* by Van Tassel Southpen having the same theme; The world, ruined by war, returns to primeval savagery. In both books the scene is laid in Great Britain, but whereas Southpen's book holds out hope for humanity, Collier's keynote is deep despair.

"The Full Circle" depicts an England devastated and demoralized by constant wars, civil as well as international. Towns and cities are non-existent. Here and there dwell groups of people, banded together in fortified, isolated farmhouses, under the leadership of the worst ruffian amongst them. Each gang dominates certain stretches of countryside and our particular gang, led by an incredible bully, decided that more women were needed. Subsequently another near by gang is raided and in a pitched battle with primitive weapons with lots of slaughter and brutality, the captured women are driven off like cattle. The chief is killed by malicious ignorance, and under the new leader who has married the best looking captive, the gang thrives. Then the fair captive escapes and treacherously betrays her captors. More battles and bloodshed until the end.

An interesting story, well worth reading.

"Man's Mortality," by Michael Arlen. Published by Doubleday Doran., New York, 307 pages, $2.00.

Is advertised by keywords such as "Man flies 1500 miles per hour"—Paris in Flames—China Challenges the World —Her Air Fleet Invincible" etc., evidently trying to create the impression that the book is something very wonderful. It is not. It is an unconvincing attempt at scientific fiction, confusedly and draggingly written.

C. A. Brandt

"The Green Scamander," by Maude Meagher. Published by Houghton Mifflin Co., Boston, 298 pages, $2.00.

Transports the reader back into antique Greek times. The heroine of the story is Penthesilea, the Amazon queen, who almost conquered the invincible Achilles.

The story is exceedingly interesting depicting that period in the history of mankind when the Iron Age began, and interesting too for its contrasting Greek and Egyptian culture.

C. A. Brandt

"The Expanding Universe," by Sir Arthur Eddington, published by the Macmillan Company, 60 Fifth Avenue, New York, 180 pages, $2.00.

A very technical book, but not so absolutely and abstrusely technical, that it cannot be read and understood by anyone who can comprehend mathematical conclusions, though not having majored in higher Mathematics.

The book is an attempt to bring to the lay mind an idea of the changes in the conception of space and time, and the relation our own small Universe has to other Universes, which have taken place since Copernicus.

When we were young we were taught that the Universe, our Universe, consisted of a Sun and nine planets, and that the other celestial bodies we saw were just Stars.

Later on we learned that most of the visible stars, some one hundred thousand million of them, including our own Sun and the entire "milky way" are the component parts of a galaxy, so enormously large in extent, that it takes light, (traveling 186,000 miles per second) 100,000 years to pass it.

Then we learned that this galaxy of ours is a nebula, one amongst one billion nebulas, which make up the Great Universe.

After that came Einstein with his theory of "curved space," the curve being in the fourth dimension, totally abolishing all our ideas of a flat, three-dimensionally extending universe.

And with this idea as a basis, mathematicians have calculated that space is not only curved but closed on itself, and that the countless galaxies separated by absolutely inconceivable distances are drifting apart yet farther and farther.

The book is well laced with mathematical formulae and will be a delight to all who are "Einsteinically" inclined.

C. A. Brandt

"The New Background of Science," by Sir James Jeans, published by the Macmillan Co., 60 Fifth Avenue, New York, 296 pages, $2.50.

All that I said in the opening and closing paragraphs of the preceding review (see "The Expanding Universe") also applies to this book.

The keynote of Sir James book is: Mathematics which, in his opinion, are the background of all sciences. Laboratory tests, experiments, astronomical observations, etc., etc., can only then be properly understood, applied and appreciated if they are firmly resting upon a mathematical foundation.

I am quite sure that a great many of our readers will like this book. They need not be afraid of the rather complicated and frequent mathematical formulae appearing in its pages. Sir James writes in such a clear, lucid style that almost anyone can understand his explanations.

C. A. Brandt

"Major Mysteries of Science," by H. Gordon Garbedian, published by Covier Friede, 386—4th Avenue, New York City, 348 pages, $3.75. This is a well written book, interesting from cover to cover. It is exceedingly fascinating, as it explains a lot of things but hints at a great many more, which still need explaining, and the readers desire for knowledge is prodded on almost every page. The book contains 27 chapters with 64 double pages of excellent illustrations.

Science, defined as the combined thought and collected experiences of countless trained investigators, thinkers and experimenters is still very young. What science has done in the last 150 years and what it is likely to do towards the ultimate solution of mechanical, vital, terrestrial, celestial and cosmic problems and mysteries, is the theme of Mr. Garbedian's book.

For a book on Science it is very easy reading, since it presents almost the entire range of scientific thought in an easily understood, as well as intensely interesting manner.

"Major Mysteries of Science" has the same relation to Science as Well's "Outline of History" has to history and "Van Loon's "Geography" to geography.

Though there are a few instances, where his statements are somewhat doubtful, from a real scientific point of view; yet its vivid presentation of known facts, its prophesies concerning future developments, make it an admirable book strongly to be recommended to all who even have only an interest in fictional science, and it would make a wonderful gift to any boy or girl interested in Science in general.

C. A. Brandt

All science fiction readers will be agreeably surprised to learn that the book, "When Worlds Collide" by Edwin Balmer and Philip Wylie will be shown on the screen in the near future. Mr. Wylie is supervising the production in Hollywood in the Paramount studio.

"When Worlds Collide" has been published in book form by Frederick A. Stokes Company, 443-449 Fourth Avenue, New York at the standard price of $2.00.

"When Worlds Collide" is easily worth twenty times that amount and all lovers of scientific fiction are urged to read it.

If it had been my duty to read the manuscript and to comment on it, I would have called it "super-excellent," and I am glad to say that I seldom read anything as well done as this particular book.

It is an astronomical fantasy of the first magnitude, exceedingly well written, with an ever increasing tension until the happy landing on a new inhabitable world ends the story, which sketchily runs as follows:

A South African astronomer is sending photographic plates to a colleague in America by a special courier Ransdell, who is sworn to absolute secrecy. Careful study of these plates and additional observation establish the unavoidable fact that out of the depth of space two large dark Planets are approaching the solar system and accurate calculations reveal the awful fact that the larger one will collide first with the moon and then with the Earth within two years.

A large group of astronomers and other scientists create the "League of the Last Days." While chaos reigns throughout the world, the League is busy collecting materials and suitable men and women. Head of the League is Dr. Cole Hendron, the foremost "Astro-physicist" of the World who selects Northern Michigan as the most stable place on the North American Continent, and there he starts building his rocketship. When the dark invaders enter the Solar System and establish an orbit around the Sun, awful earthquakes and hurricanes almost destroy the earth. But the location was wisely chosen and even the general upheaval created by the destruction of the Moon hampers the completion of the rocketship only temporarily.

In the nick of time the controlled release of atomic power is made and a courageous exploring party discovers an unknown metal thrown up from Earth's center, which is capable of withstanding the terrific heat generated in the rocket exhaust tubes by the release of atomic energy.

The time for departure draws near and fifty of the most useful people are selected and make their departure from Earth.

While in Space they witness the terrifying spectacle of the collision of the large invader with the Earth and see the Earth annihilated in one gigantic blast. The collision has thrown the invader out of its orbit and it leaves the solar system in a hyperbolic curve, never to return.

The surviving party makes a safe landing on the small invader, and when emerging from the ship, they find that small mosses have started to grow here and there on the surface. They know then that Life will continue and hopefully and courageously they begin.

A last admonition: Don't wait for the film, acquire the book and enjoy it as I did as well as my friends who bought it on my recommendation.

C. A. Brandt

"Horizons," by Norman Bel Geddes. Published by Little, Brown & Company, Boston, Mass. 293 pages. $4.75.

To pay a little over a cent and a half for each printed page is a lot to ask of even the great gullible American public.

Mr. Geddes undoubtedly is a very capable man, gifted with a splendid imagination, but his God seems to be "Utility" on whose pedestal he sacrifices everything including beauty of line and decoration.

As far as originality of design is concerned, the writer suggests the study of certain European magazines dealing with Arts and Designs, where even more startling sketches can be found than in Mr. Geddes' book.

I am glad to say however that Mr. Geddes apparently did not design much of the incredibly ugly modern book cases, chairs, tables and lighting fixtures.

C. A. Brandt.

In this department we shall discuss, every month, topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

An Encouraging Letter from a Lady Who Is Loyal to "Our" Magazine

Editor, AMAZING STORIES:

May just a plain, unscientific reader give you a few reasons why she likes AMAZING STORIES, and wishes that the magazine were twice as large?

First—"No Mush;" secondly no triangle and "sex-stuff"; thirdly no sadistic tales calculated to appeal to the instincts of cruelty within the reader, and no superstition and necromancy such as, mar for me another monthly I used to read. The "escape value" of your publication is high—one travels into a land of greater hope and promise, quite often. The horizons are opened out, and hope is given that maybe some day humanity will climb to higher levels.

My husband reads the popular scientific magazines—when we can get to a newsstand selling them. I read AMAZING STORIES and get almost as much science as he apparently.

Another point in AMAZING STORIES' favor is that I do not feel like hiding it from the children. It doesn't give them bad dreams, nor stimulate unhealthy curiosities, like a dozen first class publications I could name. I see first one and then another dipping into "Mom's dizzy magazine" to emerge thinking it far from "dizzy" in any sense.

Of course, some stories I dislike—once in a blue moon a whole issue has seemed flat, but that was probably because I was out of tune with the ideas set forth at the time.

I am a violent Merrit fan, acquiring every thing of his I can. "Moon Pool," "Ship of Ushtar," "Snake-Mother"—all of them. And a proof of my friendship is whether I will lend a person my AMAZING STORIES, or the yellowed copies of Merritt's tales—and other fantastic, and scientific fiction.

My main complaint is that in this section of Washington I cannot acquire the back numbers containing the "Skylark" and "Spacebound" stories. I got tantalizing bits of each and have a yearning for more E. E. Smith. Also more Campbell, and more by the author of the "Green Girl." Quarterlies are hard to get, so I'm hoping Santa will include the Quarterlies in the subscription this Christmas if he renews it for me.

Here's hoping that prosperity hits your concern so hard that the size of "our" magazine can be doubled and that new readers come by the score and stay true as the old bunch has done.

Yours for more, better science fiction and an ocean of paying readers (seven families read my copy).

Mrs. Helen Buller,
Marblemount,
Washington.

(Your altogether charming letter has added inspiration to our work. We feel strongly that we should reprint the "Skylark" stories, and as you may have noticed we have asked for expressions of opinion from our readers in reference to doing it. We are awaiting the return of prosperity partly for the direct effect it may have on AMAZING STORIES. We thank you for your appreciation and shall hope for more letters from you. —EDITOR.)

Cross Headings in Stories—The Uniformity of the Speed of Light

Editor, AMAZING STORIES:

I am a reader of your magazine since its very first issue, and I feel at this time, that having read every issue to date; I am qualified to pass an opinion or make a suggestion.

I see in your publication for May, that a very old-fashioned idea has made its appearance in an issue whose cover is ultra-modern.

I am referring to the brief summary title before each change of subject. You can readily see if any following lines merely describe an event that is prematurely known to the reader, speaking to the point—it takes the edge off a story.

Otherwise, the magazine is perfect, and now would you answer just one question:

Is the speed of light when it leaves the sun for the earth, greater at the sun than the same light ray when it reaches the earth.

To make it simpler—if light travels at a speed of 186,000 miles per second, that is the velocity our scientists on earth measured and found it to be—but—is it greater at its source? If not, then light must be the one force that loses none of its power by friction or distance traveled.

Here's wishing you continued success.

Sidney Nannes,
35 West 64th St.,
New York.

(The cross-headings are designed to tell nothing in advance, but to stimulate the reader's curiosity and interest. "Old fashioned" ideas are often very good ones. The speed of light is very slightly diminished as it passes through air. It loses none of its rate of transmission by distance traversed but transparent matter, air, water, glass and other transparent substances diminish the rate.—EDITOR.)

When the Magazine Was at Its Best—Reprints Desired

Editor, AMAZING STORIES:

I have been a fan for six years, ever since I read the "Moon Pool." I may have missed a few issues since, but on the whole, I believe I have been a faithful reader.

Among my favorites are Merrit, Dr. Keller, Verrill, Campbell, Williamson and Leinster.

I think the magazine was at its best in the years '27 and '28. However it is fast improving over the last few years and may soon hit its old stride again. What I've missed is the old air of weird romance that the magazine used to possess. It's been long since you've printed stories of the imaginative quality of "The Moon Pool" and "The Skylark of Space." However, "The Eternal Mask" by Kendig, in the February issue, makes up for a lot of things.

Some of the best book-length novels you've put out, were printed in the Quarterly. Among them I remember "12,000 Years After" by Coblentz. This last was, in my mind, a masterpiece of satire. The Quarterly was a great improvement over the Annual, which you put out years back.

In what issues was the "Conquest of The Moon Pool" printed? I don't recall ever having read it.

Thanks for the new serial by Verrill. Now please comply by having one by Merritt.

I am in favor of reprints, but only of stories that have appeared in the early issues of the magazine. I would like to see "The Moon Pool," which was mentioned and "The Red Dust" by Leinster.

E. S. Cooper,
(Address not given.)

(While we may not agree with you in stating that the magazine was at its best in any specific years, we are glad to know that you feel that it is fast improving. We are certainly using every effort to make it good and if we fail it will only be what is called the common lot of weak humanity. We certainly have excellent authors and you may observe that we are asking for a vote on the "Skylark of Space" stories which we would like to give as a reprint either in the Quarterly or in the Monthly. It will interest you to know that we have in our hands another story by Dr. Smith to which we hope to give early publication. When Mr. Coblentz hits his stride, he produces what you call "Masterpieces of Satire"—we consider him a particularly accomplished writer. "The Conquest of the Moon Pool" has been published by a book firm, but never appeared in our columns. We shall hope soon to give a reprint of the "Red Dust." In writing to a magazine you should always give your address which we do not find in your letter.—EDITOR.)

Questions About Thermite Welding

Editor, AMAZING STORIES:

I was very much interested in your article on Aluminum in the May issue, and especially so in your description of the Thermite process. Of course I have heard of this process but was ignorant of its application to every-day processes such as welding. I would like to "play" with this reaction a little and will be very much indebted if you can find time to give me a few details in its use. For simplicity I will ask direct, short questions.

1. Where can one secure powdered aluminum and iron oxide in small amounts and what is the approximate cost?

2. Will a blow torch supply sufficient heat for combustion?

3. Is the combustion so rapid that it will spray or explode over the operator?

4. What are the proportions of the mixture? Using one pound of iron oxide what weight pure iron will result?

5. Has the pure iron derived the properties of cast or wrought iron.

6. In welding is it necessary to make a mold around the pieces to be welded? Is there danger of burning away the pieces to be welded?

7. Has a weld of this nature the strength of an acetylene weld?

8. Can wrought as well as cast iron be welded?

9. Can a piece of iron or brass be chromium plated by dipping in liquid chromium derived from this oxide and what is the approximate cost of this oxide?

Thanking you in advance for any information you may give me.

A. M. Mulholland,
Box 684,
Bradenton, Fla.

(The thermite process can be applied to developing intense heat in an extremely short period in pieces of metal which are to be welded. For powdered aluminum or iron oxide you might address Goldschmidt Thermit Co., 120 Broadway, New York for fuller details.

To start the combustion, a simple way is to put a piece of magnesium wire down into the mass projecting therefrom and then setting it on fire with a match. The magnesium will start the combustion. The combustion is rapid but not likely to injure the operator. After starting the ignition you will have time to step back a few paces, if afraid of its spurting. If you use iron oxide you will get wrought iron as the result. A sort of sleeve should be put around the pieces to be welded—there is little danger of burning them away. The weld compares favorably with an acetylene weld. Wrought iron, it is fair to say, will lend itself better to welding than will cast iron. You cannot plate iron or brass with chromium by any such process as you intimate. It is done by electroplating with nickel and following this by electroplating with chromium.—EDITOR.)

Edward Everett Hale Not a Science Fiction Author—"Jeremiah Jones, Alchemist," Not Liked—Illustrations of These Two Stories

Editor, AMAZING STORIES:

I have just finished the May issue of your magazine, or, should I say "our" mag? Well, anyway, here is what I think of the stories.

"The Death Drum" and "Martian and Troglodyte" are hard to decide which is best. They are both very, very good stories. Please let's have more of them!

"Three Suns of Eve," "The Girl and the Glacier," "The Bronze Door" are also very good stories.

But, the stories stop there as far as I am concerned. Such stories as: "Jeremiah Jones, Alchemist," "The Good Natured Pendulum" are not the stories for you. They have no science in them. Please let's not have any more, besides any one knows that Edward Everett Hale is not a science fiction author.

Otherwise except for those two stories the magazine was a great success. The illustration for "The Death Drum" is the best I have seen in the magazine yet! Never give up "Leo" Morey.

I like very much the way you have the illustration for "Jeremiah Jones, Alchemist" and "The Good-Natured Pendulum." They are more becoming to your mag.

The stories for the next issue look good.

Joe Hennigar,
East Tawas, Michigan.

(It is a very useful thing for an Editor to get the views of readers upon the different stories. The Editor is one person—the readers are many thousands. Personally we thought "Jeremiah Jones, Alchemist" was an extremely good production. As the poet has it, "A little nonsense now and then is relished by the best of men." As regards the "Good-Natured Pendulum" we wonder if you knew, before reading it, what the law of the pendulum is as regards its periodicity as affected by its length. That law is absolute science. Edward Everett Hale wrote the story called "The Brick Moon" in which he told of people projecting a brick satellite to circulate around the earth as a new satellite in the plane of a meridian of longitude for the guidance of navigators. That story was certainly science fiction just as the "Good-Natured Pendulum" was. In "The Dot and Line" alphabet the same author tells of the Morse code being received by the five senses including that of smell. The author we are speaking of has been dead for many years.—EDITOR.)

"The Man from Tomorrow" and "The Death Drum"—Some Martians Are Good Martians

Editor, AMAZING STORIES:

This is the second letter I wrote since I've been reading AMAZING STORIES. I hoped to see the last letter in the April

issue, but somehow I missed getting it.

I would be pleased if you would have more stories like "The Man From To-morrow" by Stanton A. Coblentz. Also, "The Death Drum" by A. Hyatt Verrill.

In the May, 1933, issue of A. S., in the Discussions Columns, Bill Bailey knocks Sigmond's cover, saying it is the product of a distorted mind. He is all wrong. I'm not an artist, but that color harmony in the May issue looks good to me.

R. K. Norris in the same issue amused me. He scolds and amuses at the same time. I wish there was at least one letter like his in "Discussions" for every magazine.

I certainly wouldn't want to meet one of Morey's "Martians". I think I prefer King Kong. I'm not saying anything about him, he is fine.

I would appreciate letters from the readers of A. S. I hope there is a remote chance of seeing this letter in the next issue, as I would like some letters from them.

Vida Schneider,
125 Poningo Street,
Portchester, New York.

(Mr. Coblentz has written a good many stories for our pages, but in "The Man From To-morrow" he quite surpassed himself. We have on our desk a story by A. Hyatt Verrill, which we hope very soon to publish. It sometimes seems that our Discussions letters afford excellent subjects for the study of human nature. Some of the points of view taken are little short of extraordinary. We imagine that this correspondent is of the fair sex and if so it would account for the very nice features of her letter.—EDITOR.)

New Authors Favorably Commented On

Editor, AMAZING STORIES:

It is an obvious fact that as a magazine goes on, it is bound to lose its old authors. So, as you have mentioned two or three times before, it must cultivate and acquire new ones; you cannot publish stories by old authors only. I have set down here a few of the new writers, most of whom have written only one or two or three stories, and who are growing prospects as authors of AMAZING STORIES in the future. They are set down in my order of preference.

Stephen G. Hale wrote "The Laughing Death" and a year later its sequel "Worlds Adrift." These were his only stories, and his style is strong and deep.

Charles R. Tanner. Who is there who doesn't want more stories by this author? He wrote "Tumithak of the Corridors" and also the sequel to it, "Tumithak in Shawm." He also wrote "The Flight of the Mercury," and a short, short prize story in another mag. As far as I know that's all he wrote, but he's good—darn good.

Julian Kendig, Jr., a very good bet, who in a January, 1930 issue wrote "Four Dimensional Space Penetrator" and followed it two years later with its sequel "The Eternal Mask." You'll make a mistake if you don't print more of his work. Even though these, I think, were his only published stories, he has compact style, and shows little trace of the amateur.

William Kober wrote a story which in itself demands a sequel, "The Man Who Lived Twice." It was his only story to appear in AMAZING STORIES. It might be his very first. I liked the story immensely. He is a promising writer.

How about J. C. Dare, who wrote one story, "Cosmic Power," and was promptly forgotten by both Editor and reader? His characters and situations were well and graphically pictured. His ideas were well done. Should get more from him, but I guess we never will.

Abner J. Galula wrote a fine story in "Automaton." He also wrote "The Valley of the Blind," and that's all.

P. H. Lovering wrote "When the Earth Grew Cold" in a Quarterly and a two-part serial in the monthly, "The Inevitable Conflict." The first story I was not enthusiastic over, but the second was rich in intrigue and fine emotions, a quality lacking in most stories.

Russel Hays wrote "The Purple Plague," was praised to the skies for it and failed to reappear.

How about J. Edwards who wrote a long story, "Master's of the Earth"?

No need to mention J. Lewis Burtt, with his six Lemurian Documents, is there?

John B. Harris, author of "The Lost Machine," a good story.

Warren E. Saunders, writer of "The Sterile World," "Sheridan Becomes Ambassador," and "The Memory Stream."

J. Rogers Ullrich is not to be ignored, but his second story, "The Lunar Chrysalis" was about 200% better than the story for which it was a sequel, "The Moon Strollers."

Richard Rush Murray, author of "Radicalite" and "Stellarite," its sequel. Good stories. We'll have more from him,

I imagine. At any rate I hope that we will.

That's about all the new authors I can glean from back issues, but every one of them might be developed into an author like Keller, Vincent, Breur, the Smiths, Campbell, Olsen, Coblentz, or Verrill.

Paul Cahendon,
Cincinnati, Ohio.

(It is very pleasant as a change, to get such a letter as this one in which our authors are commended for their work. A great many of our correspondents are very severe on our writers—far more so, we think, than they deserve. No one likes Shakespeare the less for his neglect of what we may call the tiresome unities and even his famous error in geography about the land of Bohemia is overlooked and forgiven. You speak of our forgetting our authors. Every story that they send, and in many cases it has two successive readings, is judged on its merits. All we need say in answer to your letter or in comment thereon is that it is most encouraging to feel that our efforts to please our readers of AMAZING STORIES are not without result. We consider your criticisms quite interesting.—EDITOR.)

"Everyone Makes Mistakes"—A Letter Interesting if Short

Editor, AMAZING STORIES:

This is my first letter to the A. S. mag in all the years I have been reading it. It is an excellent magazine with a majority of excellent stories, the remaining few are also interesting.

There are always people criticizing the paper, covers, and the stuff you print, phooey. I thought a magazine was bought for the interest you get from the stories.

Just as long as the stories are O. K. why should they worry? And again, those who wonder at the trivial errors made in a story—well, for those I should say they are a trifle narrow-minded, everyone makes mistakes. They ought to reason out those little things for themselves and the authors should know better next time.

Now about this Grayville, he is all wrong about A. S. and what's more, since he is not interested in the A. S. who cares about his opinion? No hard feelings if you see this, Jimmey, we all have views of our own. And you, V. H.-A. R. (Amateur Radiotrician) I wish you to know that I am very much interested in the physiological type of stories. I hope we shall get many more of them.

N. R. Le Mor,
478 Mulberry Street,
Newark, N. J.

(There is a theory about mistakes which operates to lend a certain dignity to them. It is fair to say that an original investigator will make many experiments which fail before he reaches his goal and certainly an experiment which fails is a mistake. Of course there should be no mistakes in the stories, but inevitably some of them escape the most careful scrutiny and editing. We feel as you do about physiological stories and shall hope to get some good ones.—EDITOR.)

The Phases of the Moon Are Not Due to Eclipses

Editor, AMAZING STORIES:

Here are two problems pertaining to earth's moon.

In order for the shadow of earth to be cast upon the face of our moon, is it not necessary for earth to be interposed directly, or almost directly between sun and moon? All right, who can explain a shadow on the moon in mid-forenoon with the moon in the western sky; earth apparently forming a very long and acute angle at the tangent between sun and moon?

Supposing that earth is a globe, should not the shadow of earth upon the moon always be decidedly round in contour? Then why is it that the first and last quarter moon is darkened by a round shadow while the half moon is darkened by a straight edged half?

Casper J. Craig
Route 1, Box 20F,
Boynton, Oklahoma.

(You are treating the phases of the moon as if they were due to eclipses. The earth has nothing to do with them. They are really due to what the mathematicians call the shade line, varying in accordance with the relation of the sun to the moon affecting the way in which the sun's light falls on the satellite. The line is some times convex one way and sometimes the other.—EDITOR.)

An Original Presentation of One Reader's Viewpoint About AMAZING STORIES

Editor, AMAZING STORIES:

I noticed with interest the abundant material in the April issue of A. S. involving that greatest and latest of scientific mysteries, light and its complexities.

It brought to mind my story, "The Quest." The subject matter is, of course, principally metaphysical, based without

due effusiveness or technicality upon the most recent conceptions of light, relativity, etc.

Science fiction authors are, to my mind, in the philosophical category. All probably know the detached impersonal viewpoint entailed, that chill, awed feeling in the breast, the gripping, stark futility and illusion revealed, when one seems literally borne into the black vistas of eternity, where, in the immeasurable obscurity, with emotions frozen, expressionless, dazed eyes probe the inscrutable mask of ruthless infinitude—and, after this bit of cleansing, awesome insight, to shudder back once again to the finite world of men; each time with a little less *ego*, a little more humility, stripped ever further of conventional hypocrisies and with a greater contemptuous amusement at mankind's petty bickerings and flaunted "knowledge." After dwelling upon those venerable sages of illusion, the philosophers of the ages, one is yet further inclined to smile at man's awkward mouthings and gestures at understanding or lack of it.

With such beliefs, I doubt if anyone could be very irritated by Mr. Lester L. Huffman's letter appearing in April Discussions—alluding to A. S. as "mere drivel from a practical scientist's viewpoint."

I have always contended that true philosophy is actually the explorer into nature's mysteries, research being but the blind, materialistic stumbling after a spiritual or metaphysical conception. I know I should strongly dislike having Einstein's philosophy or that of Sir James Jeams converted into a machine if that were possible.

May AMAZING STORIES continue with its pleasant and invigorating explorations—despite allusions to "mere drivel."

Corliss Cunningham,
3422 Bailey Place,
Bronx, New York.

(This letter tells its own story and we can assure the writer that the words "mere drivel" have no effect whatever upon our work. AMAZING STORIES has many warm friends. The letters in the Discussions Columns disclose this fact. We have not space to print all the letters that we receive, and we make no point of selecting flattering letters in preference to critical ones—we wish to give both. A comment on your letter may be derived from the fact that correspondents have told us that they have learned a great deal of natural science from our stories.—EDITOR.)

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22	1167	39	708
23	1140	40	682
24	1112	41	657
25	1085	42	632
26	1057	43	607
27	1030	44	583
28	1003	45	559
29	976	46	535
30	948	47	512
31	921	48	489
32	894	49	467
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